CHEMICAL INDUSTRIES

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After Three Centuries

WHEN in the spring of 1635 John Winthrop, Jr. started a little manufactory for alum and saltpeter, he not only began chemical production in America, but from the very first he laid down the solid foundation of service to other industries, which is, even to this day, the basis of any successful chemical enterprise. Our chemical beginnings were at once auspicious and prophetic. It is doubly appropriate that we should signally celebrate this tercentenary anniversary.

John Winthrop, Jr. is a worthy founder of this great industry. Preeminently a man of affairs—soldier and governor—he was also a man of science, a member of the Royal Society, experimenter, collector of the first American scientific library. He was, in addition, an adventurous industrialist who saw plainly the need for salt, alum, saltpeter, and other chemical products and the economic advantages of developing the mineral resources of New England.

Throughout a busy life he pursued these industrial aims with a skill and determination which deserved a greater practical success than his very limited market for chemicals and the scanty New England mineral resources enabled him to win.

It is notable that John Winthrop's chemical operations were to make alum for tanning and saltpeter for the manufacture of gunpowder. Furs were one of the great colonial exports and gunpowder was a prime necessity of frontier life.

Thus, from its first start, our chemical industry produced products essential to the other industries and to the national defence. As our nation has grown and our industries multiplied, so the chemical industry has expanded and diversified.

The three hundredth anniversary of the younger John Winthrop's pioneering effort, celebrated by the American Chemical Society this month, in New York City, should emphasize to the country the long service and the vital service the chemical manufacturers have rendered. The usefulness of chemicals is no modern discovery. But many modern discoveries have greatly increased this usefulness.

The Voice of Experience

The collapse of the London tin and shellac markets heralds again the inevitable defeat of those who would flout natural economic laws. Late last fall when the news of the imminent crash of the zinc cartel became generally known, those who believe that cartels, speculative pools, and artificial control of production can govern the ancient law of supply and demand, pointed to the tin restriction scheme as a successful example of what might be done. Now tin and shellac also demonstrate that the result of such tampering is most distressing. Since the World War some kind of artificial market control has been tried in cotton, wheat, hogs, rubber, coffee, copper, camphor, potash, silk, sugar, sisal, sulfur, mercury, rayon, steel, aluminum, nitrates, and oleomargarine. Every such effort has ended in disastrous failure.

Reciprocity Becomes a Racket

The promise—or was it a threat?—that the resale of chemicals by unorthodox distributors would be reduced to absurdity has been made good. Sears Roebuck, Montgomery Ward, and General Foods are this year splitting three ways the alkali business of a certain Wisconsin paper mill which for years had contracted direct with a maker. Out on the Pacific Coast the Western States Grocery Company is fast becoming an important jobber of soda ash and tri-sodium phosphate.

These are but two examples of many that might be cited. But they typify the worst evils of this variety of chemical selling. In the first instance, since the paper mill is certainly paying no more for alkali than when they bought direct, the manufacturers supplying this business are beyond doubt paying their agents, the two mail order houses and the foodstuff packer, some sort of a commission for the second-hand use of their reciprocity powers. The net result is a cut in price measured by the cut-in of the curious distributors who have a hold on this legitimate chemical consumer's good will. The ultimate conclusion is that no heavy chemicals will be sold direct and all sales will pay tribute to some interloper.

The chain of grocery stores in the Far West is not only soliciting regular "l/c/l" business but they are selling such tonnage buyers as canneries, sugar refiners, and soap makers, all upon argument of you-buy-from-me-because-I-buy-from-you. As they carry no stocks, but deliver either direct from the plant or straight from the warehouse of the maker's accredited agent, the chemical manufacturer is again paying an extra toll and again business is passing out of his control or the control of his regular agent.

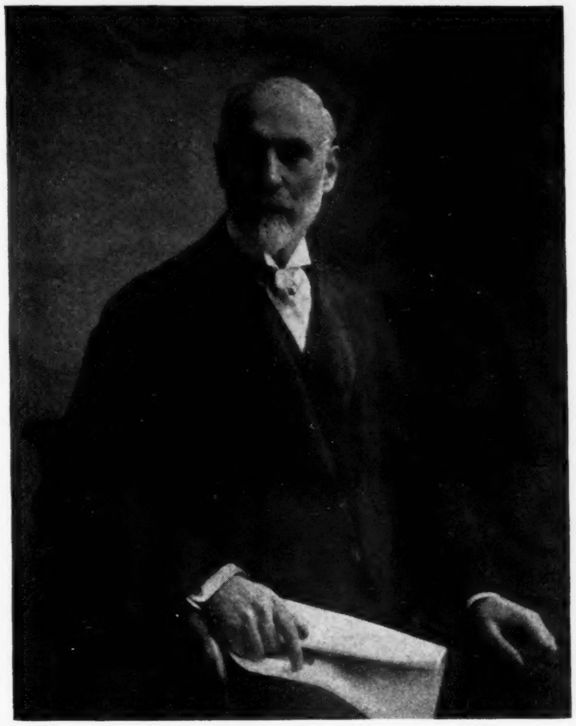
It has always been recognized that reciprocity business is full of snares and pitfalls. Reciprocity that degenerates to a racket is packed with dynamite.

Disinfectants Are Chemicals

The dangers of vicious, nonsensical, and discriminatory legislation confronting disinfectant and insecticide makers in many states concern all the chemical industry. The bill now before the house and senate of Minnesota is an example of what kind of laws the chemical specialties group is battling in eight or ten states.

The Minnesota bill as originally proposed would prohibit the sale of "drugs, medicines, chemicals, and/or poisons in any place other than a pharmacy." "Chemicals" are defined as all medicinal or industrial substances, whether simple or compound or obtained through the process of the science and art of chemistry, whether of organic or inorganic origin. "Medicines" are defined so as to include all products for "preventing" diseases, which would, of course, include disinfectants and other cleaning materials.

The sane and successful producer of chemical specialties is more anxious to protect his customers than are the publicity seeking politicians. But if many of these restrictions get on the books, sales will drop at the expense of health and cleanliness. Individually and through the various business associations within the industrial chemical group, let us extend aid in this fight. Co-operate with the work being done by the National Association of Insecticide and Disinfectant Manufacturers in organizing and leading the opposition to these damaging legislative proposals, efforts which have been successful in modifying the particularly objectionable Minnesota bill.



Chemistry Begins At Fifty

Lucien C. Warner

SEVEN months' hard labor had come to a second withering failure. William D. Patten, two chemists, and an engineer had slaved day and night to devise a process that was quicker and took less plant space than the old leaching tank operation for producing phosphoric acid. A tidy sum had been laid out in apparatus. Precious time had been lost. And as yet a solution of this problem—vital to the plans for expanding the young Warner Chemical Company—was as far away as ever.

The sorry record was laid before the president. He listened quietly, very attentively; and carefully he checked over the costs of the experiment.

"Now, Mr. Patten," said Dr. Warner, shoving the stack of papers deliberately aside, "what have we learned from this failure?"

No word of reproach, no regrets for time or money wasted, no switch in the main plan for expansion: simply the desire to win from the disheartening failure a new and better way of again attacking the same old problem. That story is told today to illustrate the characteristics that enabled Lucien C. Warner, at the age of fifty, to become a chemical manufacturer and to succeed in this complex, technical business.

It is a story almost in the vein of Oliver Optic, for the very next trial solved the phosphoric acid problem by means of a system of vacuum filters. It is quite in the approved chemical style to add that this hard-won process was itself shortly to be replaced by the Dorr system of counter-current filtration. But in the meanwhile the development of The Warner Chemical Company had gone forward apace.

A quarter of a century before Dr. Warner had formed that wholesome habit of profiting from his own mistakes. At that time, a young man of twenty-six, just graduated from the Medical School of New York University, he and his brother were traveling about the smaller cities of northern New York delivering a course of popular lectures on health and hygiene. In developing a technique of successful publicity, he learned his first practical business lessons. Upon reaching a new city, it was their custom first to give a free lecture; and they soon discovered that the attendance they could muster to this sample performance very accurately gauged the number of tickets they would sell for the subsequent series of five talks. If their free demonstration came into direct competition with some popular local event, or if the evening they had chosen should prove to be stormy, their entire stay in a town might thus be unprofitable. Years later when Dr. Warner published his reminiscences in "Seventy Eventful Years: 1841-1911," he wrote: "I feel that these bad towns were the most profitable of all, as they taught us how to meet obstacles and wrest victory from defeat."

Mrs. Keren Osborne Warner

This spirited tenacity, which he retained till the very day of his death, certainly stood him in good stead, when late in life, without experience in the chemical industry, and with only the sketchy knowledge of chemistry that was a prerequisite for an M.D. degree received in 1867, he took over a concession from the French Government to exploit a phosphate island off the Guiana coast of South America. He had on his hands a rich, but intractable, chemical raw material. It took a dozen years and a deal of clever technical juggling with processes and products to convert it into a profitable chemical enterprise. If he had no formal training for chemical manufacturing, Dr. Warner had certainly been well schooled by the hard taskmaster, Experience.

A True Son of New England

From both of his parents, through all lines of ancestry, Lucien Calvin Warner was descended from English stock who settled in New England prior to 1660. His father, Alonzo Franklin Warner, was of the eighth generation from Andrew Warner who came from England to Cambridge, Mass., in 1632. This first of the American Warners must have been an incorrigible pioneer, for five years later he moved westward to the frontier town of Hartford, Conn., and again, in 1659, on further to Hadley, Mass., where he died in 1684. For five generations the Warners stayed in western Massachusetts, and the town records of Hatfield, Plainfield, Enfield, Cummington, and surrounding places are marked well by their distinguished services against the Indians, in the Revolution, in church, school, and town offices. Then Ira Warner was again stirred by the westward urge to leave Plainfield, and with his wife, Asenath Hitchcock, he settled between Cuyler and Lincklaen, in central New York. The eldest of the twelve children of Ira and Asenath Hitchcock Warner was Alonzo Franklin Warner, father of Lucien.

As eldest son, Alonzo, save for a couple of years when he taught in the local school, was his father's chief helper on the farm. In return he was given as a wedding present a farm of about a hundred acres, near Lincklaen, a scant mile from the family homestead, and here, on December 24th, 1838, he brought his bride. She was Lydia Ann, the daughter of neighbors, Calvin and Harriet Fuller Converse. Through her father she was the descendant of Deacon Edward Converse, who came to Massachusetts with John Winthrop in 1630, and having settled in Charlestown established the first ferry to Boston, which he later turned over to his friend John Harvard in order that the income from this early public utility might be devoted to the support of Harvard College. Through her mother she traced her ancestry straight back to Captain Edward Fuller, one of the early worthies of Plymouth and Barnstable. Of this rock-ribbed lineage Dr. Warner himself wrote:

The family were all industrious and respected citizens, and nearly all were abstainers from both tobacco and liquor. The men were all farmers, and the women all married either farmers or tradesmen, excepting one, who married a physician. All were in comfortable circumstances, but only one, Lorenzo, manifested any special ability in making money. They belonged to that great class of self-respecting, intelligent and thrifty citizens so common in the early history of our country among the descendants of the early New England families.

Lucien Calvin Warner was born at the old family homestead near Cuyler, N. Y., October 26, 1841. His brother, Ira De Ver Warner, had been born in the new farmhouse at Lincklaen, March 26, the year before. Shortly before the birth of the oldest boy, the grandfather had been kicked by a young horse he was breaking and had died. Accordingly, the father, as oldest son, had been forced to return to his old home to take care of his numerous younger brothers and sisters. The management of this estate and the care of the big family were heavy drains upon his strength and resources, and within a few years, when his own sons were but seven and five, he died suddenly of pneumonia. His widow was just able to salvage enough to purchase a poor, little farm near Lincklaen, and here by dint of hard work and careful management she brought up her boys. She made most of the clothes, and they grew most of their own food. The only cash income, and this seldom exceeded a hundred dollars a year, came from the sale of butter from two or three cows. It was "a life of extreme frugality, though not often of actual hardship."

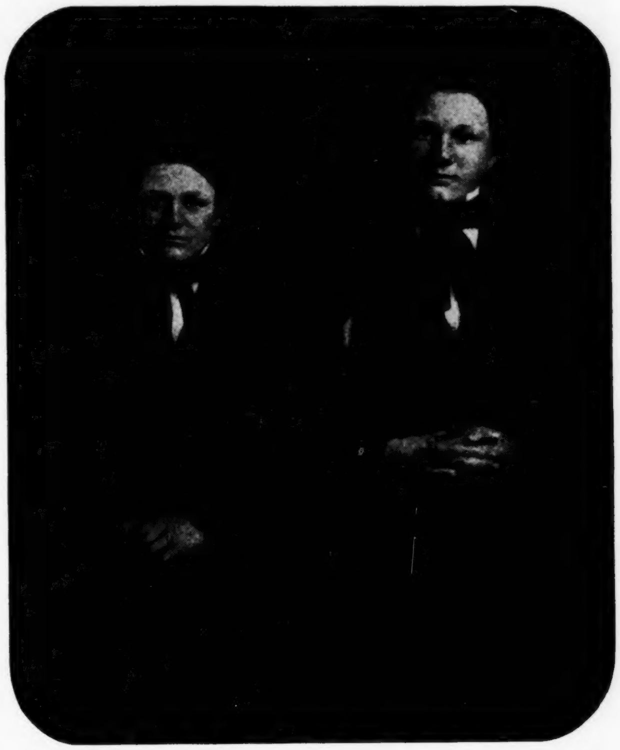
At Oberlin College

As a young boy Lucien planned to go to college. At the local school he learned quickly and remembered well, so that by the time he was sixteen he was himself teaching in a district school during the winter and attending the spring and fall terms at the De Ruyter Academy. The headmaster, Rev. Shubael Carver, encouraged him, and through his influence a scholarship was obtained at Oberlin College which young Warner entered in August, 1860. Here the same course of teaching during the winter term in order to earn his way through the spring, summer, and autumn semesters was followed, but even this had to be supplemented by serving as carpenter and handyman for the college at the wage of ten cents an hour. He paid a dollar a week board at a students club and fifteen cents a week for his unfurnished room in the dormitory. His total expenses the first full year at Oberlin were $160, about $75 of which he earned by manual labor, the balance by teaching.

These were the stirring days of the Rebellion, and twice young Warner forsook college for brief tours of military service. In the summer of '63 to volunteer with a company of fellow-students to defend Cincinnati, threatened by General Morgan's brigade; but by the time they reached the city the Confederates were already in retreat toward Kentucky. In the spring of '64 he answered a call for volunteers to man the forts at

Washington in order that the veteran troops held there might be released to join Grant's drive upon Richmond. Here he smelled powder burned in action, being a corporal in charge of one of the eight-inch cannon at Fort Stevens which was the focal point of General Early's abortive raid upon the capital.

August 24th, 1865, he was graduated from Oberlin. The next two years found him studying medicine at New York University. For the next six years the young physician practiced medicine in McGrawville, N. Y.; traveled in partnership with his brother delivering those lectures of health and hygiene which gave him



Lucien C. Warner and his younger brother, Ira Der Ver Warner, from a daguerreotype taken when they were boys in school

his first real business training; and published two popular medical books, "Functions and Diseases of Women" and "Man in Health and Disease." In 1873 he came to New York to practice medicine; but the following year, entered into a new partnership with his brother for the manufacture of corsets.

The success of the Warner Brothers corset was immediate and very great. Within ten years the sales passed a million dollars annually and by 1892 reached a total of $2,691,264. His brother had complete charge of the manufacturing in the factory at Bridgeport, and Lucien Warner in New York looked after the buying, the advertising, and the selling. Although this was his chief business interest and provided the surplus funds which led him into the chemical industry, nevertheless this is not the place to tell again the story of the W/B corsets.

Like many wealthy men Dr. Warner sought to use some of his capital in a number of ventures outside his principal business. Most of these turned out rather badly, and late in life he set forth an epitome of what he had learned by his mistakes:

Most failures in life grow out of the unwillingness of a person to profit by the experience of others. My own mistakes would nearly all have been avoided by observing four short rules:

Rule 1—Never loan a needy friend any more money than you can afford to lose.

Rule 2—Never invest in a business with which you are not familiar without first having a careful investigation made by disinterested experts of established skill and responsibility.

Rule 3—Never take stock or invest money in any new enterprise unless you are willing to devote to it your own time and energy.

Rule 4—If you are conducting a successful business do not add to it any other business, unless so closely related to it that the one helps the other.

The Warner Chemical Company proved to be the shining exception that, if it did not prove all rules, did at least disprove Rules 2 and 4.

One of Dr. Warner's unsuccessful ventures was a wall-paper company through which he became acquainted with Harris H. Hayden, an ingenious and over-optimistic soul, who with Walter S. Pearce had become interested in a deposit of phosphate of alumina on Grand Connetable Island, near French Guiana. J. Swan & Company had a concession for mining this phosphatic rock which they had transferred to the Grand Connetable Company, which in turn had assigned mining rights to the International Phosphate Company.

Among the stockholders in this last corporation was Sanford H. Steele, the attorney who later was to be vice-president of the General Chemical Company, and following Rule 2, Dr. Warner sent Mr. Steele down to the rocky islet of the South American coast to examine and report on the extent of the deposit. He estimated that, as near as he could judge, there were about three hundred thousand tons of rock, an estimate that eventually proved to be just one-third too large. The rock analyzed high in phosphoric acid, but being combined with alumina, was recognized to be difficult to make available. Nevertheless Dr. Warner was convinced that there was great value in this rock and he took an interest in the company. "One reason was that it seemed an opportunity for a profitable investment; but the stronger reason was the natural desire to do something that would compensate for the loss we were sustaining in the wall-paper company."

These may not have been very sound and logical reasons for embarking upon a career as a chemical manufacturer. They were, however, frankly faced, and once in chemical making Dr. Warner put into force Rule 4 and devoted his own time and energy to the project. The first effort was to extend the market. Up to that time the chief sales had been made in bulk to fertilizer manufacturers. Dr. Warner quickly sensed

an uncertain future in this field. The phosphoric acid was not in a soluble form and the value of the material as a plant food was already questioned by chemists. A search for new uses was undertaken in the wall-paper factory, but shortly a plant on the Harlem River in the Bronx was leased and experimental work transferred there. The first effort was to combine the rock chemically with ammonia and later with potash for fertilizer use. These trials came to nothing practical. Tri-sodium phosphate was next attempted, and Mr. Hayden, assisted by a young chemist, finally found a new, workable process.

Dr. Warner Buys Control

Encouraged by this success, Dr. Warner in 1891, when he was fifty years old, purchased the stock of Mr. Steele and took over from the J. Swan & Company their interest in the Grand Connetable Company which carried with it the original concession from the French Government. These holdings gave him control, and in 1897 he bought the stock owned by Mr. Pearce, so that he and Mr. Hayden became the sole owners. The following year Mr. Hayden retired from the business in order to go with the Eastman Kodak Company, and Dr. Warner bought his one-third interest.

Dr. Warner decided materially to expand the business. His son, Franklin H. Warner, who had evidenced a lively interest in chemistry at college, would be entering business shortly, and would eventually take over the administration of this chemical enterprise. Instead of expanding the little plant on the Harlem River, another waterfront location was found (in order, of course, to facilitate the shipments of raw material from Grand Connetable Island) and a new plant erected at Carteret, N. J. This site, at that time an undeveloped semi-swamp, bordering Staten Island Sound, has since become a great center of chemical manufacturing activity. Its selection by Dr. Warner is good evidence of his business acumen and foresight in a problem to which he devoted his personal attention, for he had now become a full-fledged chemical industrialist. "Up to this time," he wrote in his brief autobiography, "I had given but very little personal time to the enterprise . . . . but I plainly saw that if I enlarged the works and went on with the business, I must give it more personal care. This I hesitated to do, and yet there was a fascination about the unsolved problems of chemistry that attracted me."

The larger plant soon meant a longer list of products and to tri-sodium phosphate and phosphoric acid were added the di-sodium salt, in both the U. S. P. and commercial grades, for which a fast-growing market was found in the then-new process of silk weighting.

The new plant had been operating a year and this new product was just getting well established when Dr. Warner received a visit from a young man with a new chemical idea. Both patent and patentee were to become extremely important in the subsequent history of The Warner Chemical Company. The man was William D. Patten. The patent was his basic one upon the use of acid-sodium pyrophosphate for a baking powder.

Young Patten, who had been manager of the soda business of Alex J. Howell, had discovered the superiorities of the acid-sodium pyrophosphate for this use, and he was naturally attracted to the expanding of The Warner Chemical Company which was obviously well placed as to raw materials and had so recently given evidence of chemical progressiveness in the field of the phosphate salts. The acid pyro salt was at that time selling at a dollar a pound. If this baking powder market were to be developed, it must be sold at least as cheap as cream of tartar. This meant reducing the price at least three-quarters. Both commercially and technically the crux of the matter was a cheaper method of manufacturing the pyrophosphate.

Dr. Warner asked a lot of pointed questions which revealed that he was fast learning the chemical business.

Mr. Patten answered fully and frankly and with no intention of attempting to interest him in the project, for at the time all he was seeking was a reliable source of his raw materials.

Questions of Capital

Finally Dr. Warner asked point blank, "Mr. Patten have you enough money to develop this idea of yours?"

"I have enough money, I think, to work out the cheaper method of manufacturing. When that is done, knowing that the product is a better baking powder, it will then be the right time for me to interest capital. I am not going to try to raise the money for developing the market until I have my project on a commercial basis, when I should have little trouble securing capital for expansion."

"I see," Dr. Warner commented drily.

On Christmas Eve, 1901, Dr. Warner sent the message that if acid-sodium pyrophosphate could be made for ten cents, his company could do it, and that he would like to talk business.

From the very first these two men were attracted to each other and the commercial arrangements were very promptly made. The Warner Chemical Company was to make the acid-sodium pyrophosphate for two new selling companies, the Monarch Chemical Company in which Patten's interest was two-thirds and the Warner Baking Powder Company in which the two-thirds interest was held by Warner. The distinction was based upon recognition of two different merchandising problems to be solved: sales in bulk to bakers and sales to housewives in small packages. Monarch's bulk business prospered. The household market was never captured. In the end the Warner Baking Powder Company was dissolved, and it is typical of the relationship that

Judge Noah H. Osborne, Mrs. Warner's Father, with the Warner children. Left to right, Elizabeth (Mrs. William G. Gallhowher), Lucien C. Jr., Franklin Humphrey, and Agnes (Mrs. Seabury C. Mastick)

always existed between these two that Mr. Patten voluntarily readjusted their stock interest from a 66-33 to a 51-49 basis.

The first step after this affiliation was to build a plant for the manufacture of acid-sodium pyrophosphate. The operation ran into a number of anticipated difficulties and developed some that had not been foreseen; but at the end of a year, during which time Mr. Patten literally lived at the Carteret works, the kinks had all been ironed out of the process and the low cost objective won. This success stimulated Mr. Patten to perfect a new process for the production of the mono calcium phosphate, also used in baking, and led shortly to a German connection that opened up a profitable foreign market and brought the Neuberg family into connection with the Warner enterprises.

A resourceful German chemist of the staff of the Goldenburg-Geromont Company of Wiesbaden, Dr. Oscar Neuberg, had worked out a scheme for using tartaric acid as a leavening agent, and he came to America to exploit this process. Hearing of the phosphate baking powder development he went straight to the Warner offices, and after protracted negotiations, entered into a contract whereby his German company was to act as exclusive selling agents. Through Dr. Neuberg's introductions similar profitable connections were established in Great Britain. His brother William in New York was an independent sales representative for German chemicals, and two of his nephews, sons of William Neuberg, became in time the heads of two important sales divisions of the great corporation which has grown out of the Warner Chemical interests.

While working on these phosphate salts, Mr. Patten developed a process for utilizing the alumina of the Grand Connetable rock in the form of aluminum hydrate, thus turning a waste into one of the most important of the Warner chemicals. At the same time Dr. Warner was shoving along his program of diversification in other directions. Vanillin and salol were produced; but fitted illy into the logic of the chemical operations at Carteret. They were promptly abandoned, for it was one of Dr. Warner's favorite sayings that "it is the greatest indication of courage to stop when you are on the wrong course."

Out of the vanillin mistake, however, was salvaged the greatest triumph of all. Among the liquidated assets of this experiment were some chlorine electrolytic cells developed by a young chemist, H. R. Nelson, who begged Dr. Warner to allow him to go on with this work. In due time, an economic source of pure chlorine resulted in the announcement of such new and highly logical products as phosphorus trichloride, phosphorus oxychloride, acetyl chloride, acetic anhydride, and carbon tetrachloride. When the World War came, Warner was the sole American producer of these phosphorus-chlorine compounds and acetic anhydride which sprang to immediate, vital importance both in munitions making and in dye synthesis. Furthermore, it was through carbon tetrachloride that Dr. Warner and Ernest C. Klipstein were brought together.

They quickly found several common chemical interests interlinking with the electrolytic chlorine-caustic operation. Klipstein sorely needed a domestic supply of carbon tetrachloride for his Carbona company. Moreover,

his new sulfur black plant required caustic soda and he was planning the manufacture of anthraquinone and would soon need chlorine. Warner not only used caustic in the initial steps of producing his various sodium phosphates; but he had a dozen good uses for more chlorine. Over and above all, there was a big demand, at war prices, for both these basic chemicals, accordingly, any surplus above intra-plant consumption was sure of a ready, profitable sale.

They organized the Warner-Klipstein Company, gave Nelson a block of stock in recognition of his development of the electrolytic cells, selected South Charlestown, W. Va., because of its coal and salt, and built there a new plant. This operation was continuously and rapidly expanded throughout the war period. At the same time The Warner Chemical Company entered the equipment business and erected more than twenty similar electrolytic plants all about the world from Norway to India, from Australia to Canada. After we entered the war, they built for the Chemical Warfare Service at Edgewood the largest electrolytic chlorine plant that up to that time had been constructed.

When, upon the Armistice, the enormous, but artificial demand for all sorts of chemicals stopped abruptly, Dr. Warner boldly cut and consolidated the operations in both plants. He took over the common stock interest of E. C. Klipstein and all the interest of H. R. Nelson who elected to take a cash settlement and retire from active participation. Having trimmed the ship, he stepped down from the bridge, and his son Franklin H. Warner succeeded him as president.

Dr. Warner died in 1925, and three years later the Westvaco Chlorine Products Corporation was organized to merge into one unit the various Warner chemical enterprises. Twelve years before a young man, William B. Thom, had joined the organization, as assistant to Franklin Warner who was then the treasurer. When the young Mr. Warner retired to California, the younger Mr. Thom became the active head of the recently consolidated corporations. Though he thus became the most youthful of all big chemical company presidents, he disclaims that youth must be served.

"Dr. Warner was the perfect refutation of that silly saying. He himself said that interest and energy, because they combined in hard work, were the prime requisites for success, nevertheless he was a living example of the value of experience. He was eighty-three years old and he had made two fortunes in two very different industries; but he was keen and alert, open-minded to new ideas, enthusiastic for new ventures. His practical, first-hand business experience was very great, and nothing can replace it, for it is the surest guide to correct policy and right action."

Lucien Warner possessed mental traits that in the law would have led him to the judicial bench. He had a rare gift for listening to the pros and cons and then summing up the question in a few terse, clear sentences. Even today his associates are fond of quoting many such "Poor Richard Proverbs" of his as:

"If you have several reasons for not doing something, pick the best and give that one only."

"If you are not in business to make money, you will soon be put out of business."

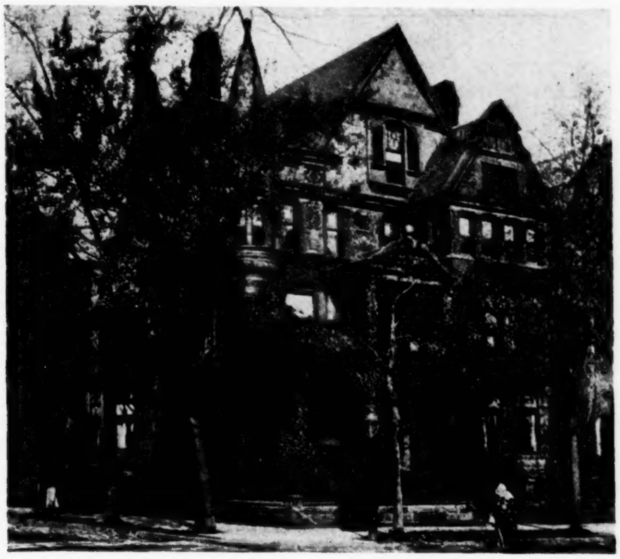
"A committee is slow, but it is sure."

As quite a young man Dr. Warner consciously chose to devote but half his waking hours to business, and no sketch of his life would be truthful that omitted two great outside interests, foreign travel and public works. When he was working, he was in the office before the first mail and even in his latter days put in a full day at his desk. He simplified his routine and concentrated his efforts masterfully, never slighting any task or responsibility; but deliberately planning to restrict his business hours. For many years he was a devoted friend of the Y. M. C. A., Oberlin College, and the Congregational Church, giving generously of his wealth and his time to these causes that had his warm sympathy and active support. Since 1880, when he and Mrs. Warner made their first trip abroad, he went on long trips every year. This was his great hobby, shared

Dr. Warner's home, Osborne Terrace, at Irvington, N. Y., which he purchased in 1896, and where the family lived until the children were married and the house sold in the Fall of 1903

with the wife who was constant companion and closest comrade.

At seventy, after careful thought, Dr. Warner reached a decision that he kept to the end: "As a physician," he said to one of his sons on his birthday, "I am aware if I watched my diet and my exercise and was careful to dodge away from winter cold and summer heat, it is likely that I should be able to add several years to my life. If I did so, I should have time and



The Warner home at the northwest corner of Fifth Avenue and 126th Street, New York

energy for little else, and I should quickly become quite useless to other people. I prefer to go on with my works, to do all that I can as long as I am able."

The thirteen years he lived after reaching this decision were momentous ones for the chemical industry since they embraced the period of the World War. They were most important years in the history of the business that we know today as the Westvaco Chlorine Products Corporation. The courage and the tenacity and the great business experience of that sturdy veteran, who had resolved to carry on during these strenuous times, were indeed a notable contribution to the growth of our American chemical industry.

Desulfurization

During the coagulation of viscose in the production of artificial silk and cellulose transparent paper a quantity of sulfur is deposited on the product by reason of the action of the sulfuric acid of the coagulation bath, the cellulose xanthate being decomposed; a further source of sulfur being the sodium sulfite present in the viscose to reduce the evolution of sulfuretted hydrogen. The sulfur, in part, adheres to the yarn, or sheet, and is removed by the chemical treatment of the regenerated cellulose. A number of methods and varying conditions are employed by manufacturers, the main chemicals used being sodium sulfite, sodium sulfide with or without the addition of caustic soda. The importance of an efficient desulfurization is reflected in the appearance of the final product. It sometimes happens that the finished yarn is uneven as regards its lustrous appearance, and its dyeing characteristics. On such occasions an investigation is carried out in an attempt to discover the root cause of the trouble. The points in the process at which faults, which would cause unsatisfactory dyeing properties, may have been introduced are unfortunately numerous. On examining the preparation of the viscose, spinning, etc., no adequate cause may be found for the above uneven qualities. The real cause on these occasions lies in the desulfurizing of the yarn. Such an investigation as outlined above is stopped on finding, for one reason or another, that the yarn has recovered its lustre and affinity for dyestuffs. This recovery in evenness of property coincides with the renewal of the desulfurizing liquor.

It therefore follows that the uneven appearance of the finished yarn is due to inefficient desulfurization, which in turn is caused by a largely exhausted desulfurizing liquor.

The removal of sulfur in the production of artificial silk is achieved by a treatment with sodium sulfide liquor, with or without the addition of caustic soda. The estimation of these liquors is best carried out—when in fresh condition—by the use of a standard solution of iodine, and a direct acid titration. (1) The determination of the percentage of soldium sulfide: the quantity of iodine reduced by 100 cc. of the bath liquor will be calculated as Na_2S, and the percentage found will be taken as a basis for the re-strengthening of the bath in sodium sulfide. (2) The determination of the percentage of caustic soda: the bath liquor will be directly tested by a standard acid solution, from the result of which the necessary addition of caustic soda will be calculated.

The above liquor after use will, however, contain a number of new compounds, which are introduced by reason of the desulfurizing action. These compounds have no desulfurizing power whatsoever, but are capable of reducing iodine giving a similar effect on analysis as the original sodium sulfide. Therefore, if an estimation on the used desulfurizing bath is carried out as above, a totally incorrect idea is obtained of its desulfurizing power, in that a high iodometric value is found. As a consequence the liquor is employed after its desulfurizing power has decreased below a value at which it is effective at the temperature and during the time it is in operation.

A more detailed review of the reactions occurring in the bath will indicate a method of analysis by the use of which the above erroneous results may be avoided.

(1) Desulfurizing liquor: sodium sulfide solution equal to 1.5 per cent.

The reaction taking place in a bath containing sodium sulfide only is largely the formation of the polysulfides of sodium, thus, $N_2S+2S=Na_2S_3$, etc. Sodium polysulfide has no desulfurizing properties, although it is capable of reacting with iodine. When the bath has been used for a certain period the quantity of sodium polysulfide will exceed the sodium monosulfide, but this will not be shown in the iodometric estimation of the solution. The desulfurization process will therefore be unsatisfactory, and a certain amount of sulfur will remain in the treated yarn.

After use the desulfurizing liquor will contain sodium monosulfide and polysulfide. A further complication is the action of free sulfuric acid, which may be carried over by the yarn. The presence of the acid promotes the formation of sodium hydrosulfide, and this must also be allowed for in the method of estimation. The solution will therefore contain Na_2S, Na_2S_3, and NaSH.

(a) The first iodine estimation will give the total amount of sodium hydro plus mono- plus poly-sulfide.

(b) A separate sample of the bath is neutralized with sodium carbonate, and the monosulfide, and hydrosulfide separated by the addition of barium chloride solution. The precipitate is filtered and washed, and titrated separately with iodine. This result gives the quantity of Na_2S and NaSH.

(c) The quantity of NaSH present is calculated by means of an acid titration. This value compared with the total amount of reductive substances present will allow the quantity of sodium hydrosulfide present to be calculated.—*By Dr. C. L. Moore, abstracted from Silk & Rayon.*

Chemical Holdings of the Investment Trusts

By Fred A. Hessel

THE marked increase during 1933 in the chemical holdings of leading investment trusts did not continue in 1934. Consumer's goods and inflation stocks were more popular and chemicals lost ground somewhat—due, possibly, in part to the high ratio of price to current earnings. The trusts, which have shown most interest in chemicals, reduced the percentage of amount invested in chemical stocks to total common stock holdings:

	1933	*1934*
Lehman Corporation	7.3	4.8
Incorporated Investors	18.5	17.7
Tricontinental Corporation	7.7	3.9

Instead of further diversification in the chemical field the trusts, last year, invested in fewer chemical companies. Lehman Corporation and General American alone added to their lists of chemicals; Adams left theirs unchanged, while the others (Table I) shortened theirs.

The same table shows, however, that all trusts which dropped specific chemical companies did not decrease their total number of chemical shares. These were increased, indeed, by Capital Administration, Vick Financial Corporation, and General American Investors.

TABLE II.

Investment Trusts	*1930*	*1931*	*1932*	*1933*	*1934*
DuPont					
Adams Express	2,000	....	1,000	....	....
General American	....	....	....	4,000	2,000
Incorporated	18,600	13,600	15,000	15,000	15,000
Lehman Corp.	3,000	....	....	14,000	8,000
Capital Administration	1,000	....	500	500	....
Vick Financial	500	....	....	1,000	500
Tricontinental	2,700	....	1,000	1,700	....
Union Carbide					
Adams Express	10,000	12,200	13,200	12,200	12,200
General American	2,000	....	....	....	....
Incorporated	23,600	24,000	25,000	20,000	15,000
Lehman Corp.	14,700	4,800	10,000	14,000	9,000
Capital Administration	5,000	....	500	1,000	....
Tricontinental	14,000	....	1,000	6,000	....
Allied Chemical					
Adams Express	1,050	14,500	3,500	3,000	3,000
General American	....	....	5,500	6,000	4,500
Incorporated	9,000	....	5,000	....	....
Lehman Corp.	2,100	....	5,000	....	....
Capital Administration	550	....	....	....	....
Vick Financial	....	800	....	1,500	2,000
Tricontinental	1,700	....	2,600	500	....
Eastman Kodak					
Adams Express	4,500	4,500	4,500	4,500	4,500
Incorporated	6,200	....	....	....	....
Lehman Corp.	3,000	....	....	....	500
Capital Administration	....	....	750	500	800
Vick Financial	....	....	....	1,000	1,700
Tricontinental	2,000	....	4,000	5,000	3,500
American Cyanamid					
Tricontinental	....	....	....	1,000	....
Dow Chemical					
Incorporated	....	....	....	4,600	4,500
Lehman Corp.	....	....	....	5,400	5,500
Colgate Peet Palmolive					
Lehman Corp.	4,800	....	....	....	....
Capital Administration	1,000	....	....	....	....
Vick Financial	....	300	....	....	....
Freeport Texas					
Incorporated	....	....	....	10,000	....
Lehman Corp.	....	....	9,000	11,500	10,700
Vick Financial	....	....	....	2,000	....
Mathieson Alkali					
Adams Express	17,600	20,000	20,000	15,600	21,400
U. S. Industrial Alcohol					
General American	....	2,000	10,000	....	....
Incorporated	....	....	....	11,500	15,000
Lehman Corp.	....	....	6,400	....	....
Capital Administration	....	....	....	1,000	....
Tricontinental	....	....	....	2,000	....

TABLE I.

Investment Trusts	*Number of Chemical Companies Represented*						*Total Number Shares of Chemical Stocks Held*					
	1929	*1930*	*1931*	*1932*	*1933*	*1934*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*
Adams	4	8	6	8	5	5	15,360	48,150	48,150	63,200	40,300	46,100
General Am. Inv.	5	1	1	3	3	5	21,030	2,000	2,000	20,500	14,000	19,500
Incorporated Inv.	5	6	3	5	8	6	73,500	83,400	47,600	57,000	94,600	65,100
Lehman Corp.	3	6	2	5	13	14	20,500	41,600	12,300	32,400	124,700	89,700
Capital Administration	2	3	1	6	7	6	4,500	6,550	500	7,050	5,100	5,750
Tricontinental	7	4	1	6	11	6	49,500	20,400	1,000	14,900	30,600	11,700
Vick Financial Corp.	3	4	2	0	9	7	6,900	6,000	11,000	.....	12,300	12,900

Investment Trusts	1930	1931	1932	1933	1934
Texas Gulf Sulphur					
Adams Express	....	....	500	....	....
Incorporated	....	....	....	....	....
Lehman Corp.	....	....	....	6,000	1,000
Capital Administration	....	....	800	....	....
Vick Financial	2,000	....	....	2,000	....
Tricontinental	....	....	2,400	....	....
Commercial Solvents					
Adams Express	5,000	5,000	5,000	5,000	5,000
Incorporated	....	....	....	15,000	....
Capital Administration	....	....	3,000	....	....
Tricontinental	....	....	2,600	....	....
Air Reduction					
Adams Express	3,000	....	....	....	....
Incorporated	9,000	10,000	12,500	10,000	10,000
Lehman Corp.	14,000	7,500	2,000	2,200	1,800
Capital Administration	....	500	1,500	600	....
Vick Financial	2,500	300	....	1,000	2,200
Tricontinental	....	....	4,000	1,000	....
Hercules Powder					
Incorporated	....	....	....	8,500	8,600
Capital Administration	....	....	....	700	50
Tricontinental	....	....	....	2,000	....
Monsanto					
Incorporated	....	....	4,000	....	....
Lehman Corp.	....	....	....	7,200	8,100
Vick Financial	....	....	....	1,000	....
Sherwin Williams					
Lehman Corp.	....	....	....	5,000	5,600
Capital Administration	....	....	....	....	1,400
Tricontinental	....	....	....	....	2,000
Columbian Carbon					
Lehman Corp.	....	....	....	3,000	....
Vick Financial	....	....	....	....	1,500
United Carbon					
Lehman Corp.	....	....	....	12,000	11,600
American Commercial Alcohol					
Tricontinental	....	....	....	1,000	....
Atlas Powder					
Lehman Corp.	....	....	....	....	5,300
Capital Administration	....	....	....	800	400
Tricontinental	....	....	....	3,400	....

Investment Trusts	1930	1931	1932	1933	1934
Devoe & Raynolds					
Capital Administration	....	....	....	....	1,100
Tricontinental	....	....	....	....	1,500
Glidden					
Capital Administration	....	....	....	....	2,000
Tricontinental	....	....	....	....	2,000
American Agricultural Chemical Company					
Tricontinental	....	....	....	....	900

Table II shows just what switches were made. Taking Lehman Corporation first, they dropped Columbian Carbon, reinvested in Eastman Kodak and added Atlas Powder to their list for the first time. Adams, with an unchanged list of chemicals, increased their holdings in Mathieson Alkali. Incorporated Investors dropped Freeport and Commercial Solvents, decreased their holdings of Union Carbide, and bought more shares of Dow, U. S. I. and Hercules. Capital Administration dropped Du Pont, Union Carbide, U. S. I. and Air Reduction, invested for the first time in Sherwin Williams, Devoe & Raynolds and Glidden, decreased their holdings in Hercules and Atlas Powder and bought more Eastman Kodak stock. Tricontinental made much the same moves, dropping Du Pont, Union Carbide, Air Reduction, U. S. I., Atlas and Hercules, Allied and American Commercial Alcohol, and adding Sherwin Williams, Devoe & Raynolds, Glidden and American Agricultural. Vick Financial dropped Monsanto, Texas Gulf, U. S. I., added Columbian Carbon decreased their Du Pont holdings and increased Eastman Kodak, Allied, and Air Reduction.

From the standpoint of the chemical companies, these changes are analyzed in Table III which shows the amounts invested by the various trusts in each of the chemical companies in '29, '33 and '34, and the per cent.

TABLE III.

Chemical Companies	Amounts Invested by Trusts 1929	1933	1934	Per cent. of Total Invested in Chemical Shares 1929	1933	1934
Union Carbide	$5,076,540	$2,401,400	$1,705,900	26.1	14.7	11.9
Allied Chemical	5,023,650	1,628,000	1,306,200	25.8	9.9	9.2
Du Pont	2,925,000	3,475,200	2,428,300	15.0	21.2	17.0
Air Reduction	2,375,000	1,465,200	1,575,000	12.2	8.9	11.0
Eastman Kodak	2,318,000	891,000	1,232,000	11.9	5.4	8.6
U. S. Industrial Alcohol	411,000	768,500	667,500	2.1	4.7	4.7
Commercial Solvents	381,300	640,000	108,100	2.0	3.9	.8
Texas Gulf Sulphur	357,500	320,000	34,000	2.0	1.9	.2
Mathieson Alkali	284,700	561,600	712,400	1.5	3.4	5.0
American Cyanamid	224,000	16,000	......	1.1	.2	...
Monsanto	99,470	672,400	478,000	.5	4.1	3.3
Freeport	......	1,057,500	275,500	...	6.5	1.9
Dow Chemical	......	715,400	1,176,500	...	4.4	8.2
Hercules Powder	......	683,200	644,400	...	4.2	4.5
United Carbon	......	456,000	553,300	...	2.8	3.9
Sherwin Williams	......	240,000	778,500	...	1.5	5.4
Columbian Carbon	......	183,000	112,125	...	1.1	.8
Atlas Powder	......	159,600	228,000	...	.9	1.6
American Com. Alcohol	......	53,000	......	...	.3	...
Devoe & Raynolds	......	......	131,300	...	...	.9
Glidden	......	......	109,500	...	...	.8
American Agric. Chemical	......	......	42,300	...	...	.3
Total	$19,476,160	$16,387,000	$14,298,925	100.0%	100.0%	100.0%

each represent, each year, of the total investment in chemical shares.

The four chemical leaders, except Air Reduction, had a lower percentage rate in 1934 than in 1933 and all were held by fewer trusts. Du Pont, which was the most popular in 1933 and had the largest percentage, still retained the latter advantage in 1934 but it had shrunk from 18.8 per cent. to 15.7 per cent., while Eastman Kodak had become the most popular chemical stock and next to Sherwin Williams (which was also more popular in '34 than '33) and Dow showed the largest increase in percentage. Eastman's popularity is probably due in part to its inventory in silver and to the development of their cellulose acetate rayon.

The largest decreases in percentage were shown by Freeport and Du Pont, all held by fewer trusts in 1934. Freeport's setback may possibly be explained by the company's mining trouble. Du Pont's is harder to explain, especially in view of Dow's progress, as the latter stock is probably even selling at a higher ratio to earnings.

The new interest seems to be in paint stocks. Sherwin Williams showed the largest increase in percentage of all chemical stocks in 1934 and it was held by more trusts than the year before, while Devoe & Raynolds and Glidden made their first appearance last year on the lists of investment trusts, all this partially due to the Administration's efforts to stimulate the building trade. Another newcomer in 1934 was the American Agricultural Co., the first common stock of a fertilizer company to appear on the list of the group of investment trusts studied. Its presence is explained by the fact that last year the fertilizer industry made real money for the first time in several years and that it has prospects of doing even better this year.

Chemical Compounding

By H. Bennett

THE training a chemist receives is principally analytical, theoretical, and synthetic. The embryonic chemist masters these subjects to the best of his ability and even visits plants of the process industries and may even work therein during vacations, which gives an extremely valuable experience. On graduation, if he obtains a position in a plant, he soon learns that he is just starting a long drawn out period of apprenticeship. He discovers that much that he has learned may never be used.

During his college course he learned the value of many reference books: organic compounds in Beilstein; constants from The International Critical Tables; about calculations and empirics from various handbooks. In the analytical or research departments, such sources of information are satisfactory. If, however, he is in the production, development, or service departments, then they do not suffice.

He may have to devise a lute or cement to withstand the action of some new corrosive materials. He may have to mask the odor of an old product for a new use. He may have to develop an ink to produce a novel effect on a new type of wrapping material. He may be called on to match a competitive polish or varnish. He may be asked to concoct an insoluble, flexible coating. He may be compelled to waterproof a textile material in a new way. Countless examples of such every day exigencies could be given.

If time permitted, such problems could be turned over to the research department. In many cases, they finally do get there. Many of these problems, however, are urgent. If not solved forthwith, production may be slowed down or stopped; new outlets may not be reached or lost; customers may become dissatisfied; products may become obsolete; etc., etc.

"Rule of thumb" methods, formularies and "cook-book recipes," as some disdainful chemists refer to them, very often solve some emergency problems. At least, they offer a starting point or idea which often leads to a rapid solution. True, such formulas may be without rhyme or reason; they may not be pure chemical compounds. But if they answer in an emergency, when results are needed quickly, they are a blessing in disguise. If their heredity is obscure, what of it? Research, at leisure, can always polish them and sometimes can even find "a reason why."

That portion of industry engaged in syntheses is fundamentally built on chemical reactions. On the other hand, most manufacturing processes using chemicals are not strictly chemical. Here chemicals are mixed or compounded to produce physical properties that fill a definite requirement or use.

Thus, a user of an adhesive is not interested in whether it contains casein, glue, albumen, or silicate of soda, or what have you. He may have specifications as to viscosity, stability, and cost, but no interest whatsoever in the chemical nature of the adhesive except that it does not adversely affect the finished product or its sale.

A textile finishing material may have to conform to many rigid requirements as to color, odor, aging, ease of removal, etc., etc. These, however, are all physical properties. No chemical reaction may be involved in its compounding. No chemical reaction takes place with the textile being treated. The user is not particularly interested whether olive oil, soya bean oil, mineral oil, sulfonated castor oil, soap, or solvents, are present. What he is interested in is in getting a desirable and marketable finish for his fabric.

Often our so-called chemical industries depend more on chemical compounding than on chemical syntheses.

Flame Retarding Cellulose Acetate

By Arnold Kirkpatrick

Monsanto Chemical Company

CELLULOSE acetate has a relatively slow burning rate usually described as "of the same order as news print." Frequently, however, it is desired to further reduce that rate to a point where the cellulose acetate will not burn without continued application of a flame. The method for accomplishing that purpose is not always clear and must depend upon the form in which the cellulose acetate is to be used and the method of producing it.

Exclusive of acetate silk, the forms in which cellulose acetate is worked up may be divided into three general classes, namely: sheets or coatings obtained from solutions of the cellulose ester in volatile solvents; sheets, coatings or molded compositions made by dissolving the ester in a plasticizer or a mixture of plasticizers without the use of large amounts of volatile solvents; molding powders made with the use of a small amount of volatile solvent which is removed before the molding operation. The dividing line between the second and third classes is not closely drawn and for our purpose they may be considered as one. All the forms may or may not include the use of fillers and pigments.

The term "fire proof" is rather indefinite and should really be "fire resistant." A product may be essentially fire resistant for one purpose but not at all acceptable for another.

A thin coating applied to a wood surface may burn less readily than the wood itself and may be considered as completely satisfactory, but if the same composition is used as an insulating coat on wrapped electric cord, it may fail entirely under the tests applied to such a product.

When the term "fire proof" is used, testing methods should be specified. The underwriters' specification test for insulated wire is made by suspending the test piece of wire in a vertical position on a frame shielded from air currents. A standard gas flame is applied to the lower section of the wire for fifteen seconds then removed for fifteen seconds. This cycle is repeated five times. The insulation must not burn for more than a specified distance up the wire. The heat conducted by the wire, the flame reaching upward toward fresh surfaces, and the heated coating tending to flow down into the burning area, all produce severe test conditions. It is obvious that such a test is in no way comparable to the usual method of merely coating a wood or other surface and applying a flame to it.

Triphenyl phosphate is probably the most efficient commercial fire retarding material with a sufficiently high compatibility for safe use with cellulose acetate. Fillers and pigments in general reduce the burning rate but in many cases their use is not permissible. Liquid plasticizers lower the softening point of cellulose acetate and add nothing to the fire resistance.

The fire proofing of sheets or coatings derived from solutions of cellulose acetate in volatile solvents is easily accomplished if too great plasticity is not desired. Triphenyl phosphate is readily soluble in most of the common solvents and can be put directly into the cellulose acetate solution. An amount equal to 20 per cent. of the acetate weight gives a product that after evaporation of the solvent does not support combustion. Amounts up to 70 per cent. may be used without great danger of separation and the product is firm and tough, with a fair degree of flexibility.

When pigments are used they should first be ground in a small amount of the solvent. This, of course, is standard practice and well known. When other plasticizers are necessary in order to obtain increased flexibility, then the proportion of triphenyl phosphate must be increased as much as possible in order to maintain a slow burning rate.

Fire retarding of compositions made without the use of volatile solvents is another story. Triphenyl phosphate is, when used alone, not an active solvent for cellulose acetate, therefore, considerable amounts of a solvent plasticizer must be added. Moreover, if pigments are to be used in a mixture of this type, they should first be ground in part of the plasticizer so that they will work into the mass smoothly and not interfere with the flexibility of the product. Methyl phthalyl ethyl glycollate gives excellent results both from the point of view of solvent action on cellulose acetate and for grinding the pigments. It has a low rate of volatility, good wetting action on pigments, and

does not discolor readily. Grinding of the pigment or filler with part of the plasticizer should be emphasized. A thorough wetting of the solid particles with a solvent plasticizer having the right physical character not only aids dispersion but provides a perfect bond between the pigment and the acetate and allows the particles to move smoothly within the mass, thereby insuring flexibility.

A relatively small amount of methyl phthalyl ethyl glycollate when heated with triphenyl phosphate gives a solution which will dissolve cellulose acetate. The larger the proportion, the more rapid will be the solvent action. Three parts of methyl phthalyl ethyl glycollate and six parts of triphenyl phosphate will readily dissolve ten parts of cellulose acetate. Triphenyl phosphate will, however, crystallize from such a composition and a toluene sulfonamid-formaldehyde resin should be added to maintain the compatibility. The character of the cellulose acetate partly governs the ease of solution and mixing. In general it may be said that the lower the viscosity and the higher the acetyl content of the acetate, the more rapid the rate of solution and the more mobile the mass.

Toluene sulfonamid-formaldehyde resins are entirely compatible with all the materials mentioned and small amounts increase the plasticizing action of the plasticizer and prevent separation. Their use permits handling mixtures at lower temperatures, gives better flexibility, adhesion, and gloss to the product and has little effect on the burning rate. The effect on flexibility is very pronounced. Ten parts of cellulose acetate dissolved in a mixture of six parts each of triphenyl phosphate and methyl phthalyl ethyl glycollate produce a rather stiff product. The addition of one and a half parts of resin gives a very flexible product and if the amount of resin is increased to four parts, the product begins to show signs of tackiness. Varying the proportions as given above to five parts of methyl phthalyl ethyl glycollate and seven parts triphenyl phosphate to each ten parts of cellulose acetate, increases the hardness and brittleness of the product and also increases the tendency for triphenyl phosphate to crystallize.

When compositions of this sort are coated on wood, paper, cloth or metal, they are sufficiently fire resistant for most purposes. They will not, however, meet the tests required for electric cord insulation. As an indication of the burning rate, ten parts of cellulose acetate in six parts of triphenyl phosphate and three parts of methyl phthalyl ethyl glycollate, when coated on a wooden panel and a burner flame directed on the edge so that portions of uncovered wood and of composition are heated simultaneously, the wood will maintain a flame sooner than the composition.

The addition of inorganic fillers gives added protection and permits the composition to meet the tests for insulated cord quite satisfactorily. If a thin film is applied to the middle of a piece of paper and the edges of the paper ignited, the covered area will not burn.

The approximate limiting temperatures for compositions of this sort are revealed by the flash points. Triphenyl phosphate itself flashes at about 225°-230° C. Methyl phthalyl ethyl glycollate flashes at about 190°-195° C. A mixture of equal weights of the two has a flash point of about 200°-205° C. A solution of ten parts of cellulose acetate in six parts each of triphenyl phosphate and methyl phthalyl ethyl glycollate will flash at 205° C. but must, of course, be heated very much hotter before it will actually burn.

Paper or cloth can be satisfactorily coated by applying the mixture while warm and pressing between warm rolls. By balancing the proportions of cellulose acetate, plasticizers and resin, a wide range of hardness and flexibility can be covered. Careful control of temperature during the mixing enables one to maintain a very light color.

To summarize:

1. Fire resistant cellulose acetate sheets of medium flexibility can be made from solutions in a volatile solvent in which 20 per cent. or more of triphenyl phosphate based on the cellulose acetate weight is dissolved.

2. Fire resistant compositions of medium flexibility can be produced by dissolving cellulose acetate of the proper acetyl content and viscosity in a hot mixture of triphenyl phosphate and methyl phthalyl ethyl glycollate.

3. Increasing the proportions of methyl phthalyl ethyl glycollate improved the flexibility at the expense of fire resistance.

4. The fire resistance can be increased by incorporating non-combustible fillers which have been ground in methyl phthalyl ethyl glycollate.

5. Flexibility, gloss, adhesion and stability are increased by the addition of small amounts of toluene sulfonamid-formaldehyde resins.

Ramie's Limitations

Research has discovered why it is that ramie, or China grass, while one of the glossiest and apparently one of the strongest of the natural textile fibers, has thwarted efforts to utilize it on a large commercial basis. In China and the Far East it has been prepared and spun by hand labor for centuries. Millions of dollars have been spent in attempts to perfect chemical and mechanical methods of decorticating and degumming the fiber, but none have been successful on a commercial scale. The fiber, and yarns and fabrics produced therefrom, have always proved to be weak when subjected to bending and torsion sharply angular to the yarn axis. This was assumed to be a fault of the methods used in preparing the fiber for spinning, but scientific research has proved that it is due to faults in the micellar structure of the fiber, that are strikingly similar to geological faults, according to *Melliand and Rayon Textile Monthly*.

This discovery was made by G. Gordon Osborne, a Textile Foundation fellow working under the direction of Prof. E. R. Schwartz at Mass. Institute of Technology, on Micro-Analysis of Textile Fibers. The second report of his study, appearing in the December number of *Textile Research*, published by U. S. Institute for Textile Research, Inc., covered "Observations on the Structure of Ramie" and his explanation of the discoveries referred to will be found in the last two sections of the report.

Ramie's brittleness, lack of resistance to flexing, and low-extensibility are due to trans-fiber fissures which vary in depth, and of which several may be found in one cross-section of the fiber. Mechanical action, states Mr. Osborne, "starts and intensifies the formation of these markings and, as treatment proceeds, the number of trans-fiber fissures increases."

Budget Control

By V. R. Bechtel

Budget Director, American Cyanamid Company

IV

Projection of Business Conditions

SPACE limitations will not permit going into many important problems and procedure involved in the preparation and use of our budgets. For example, one of the most important factors in the preparation of and the value of budgets when completed is in the accuracy of appraisal of general business conditions for both the immediate and longer range future. This appraisal must be made both generally and specifically by industries, also geographically and in many instances must be made by individual or groups of products.

In normal times a reasonably accurate forecast can be made in the appraising of general business conditions. Probably at no time in the history of industry has it been more difficult or more necessary to accurately appraise future business conditions than during the past five years. The likelihood is for a continuance of these difficulties for several years to come. We are sure to make many errors in judgment in setting up our future business plans and some will be important errors. I am certain, however, that an organization experienced in this work, with a little common sense and a knack of securing a real "Ear to the ground" picture of what is happening in the industrial world, can put together a program which, on the whole, will be extremely helpful to the management in steering a course through troubled business seas.

There are numerous statistical records available which can be used as a basis for judging the trend of business, in general and specifically, by industries as well as geographically. A partial list includes:

General Business

Freight Car Loadings	Steel Production and Shipments
Imports and Exports	Auto Production and Sales
Commodity Prices	Construction Awards
Employment and Payrolls	Store Sales
Commercial Failures	New Financing
Bank Deposits and Loans	Security Values
Electric Power Consumption	

Specific or Geographical

Population Records	Income Tax Payers
Auto Registrations	Number of Telephones
Educational Institutions	Magazine Circulation
Public Utility Customers	Buying Power Indexes

In order to secure the benefits and background of statistical studies in the preparation of our operating budgets, the statistical department has been combined with our budget department. The task of correlating statistics into a background for establishing budgets is one which requires much time and effort. We still have a considerable task before us to provide statistics on a basis to realize their full potential benefits in the preparation of our budgets.

Under the direction of Mr. E. A. LaRose, Assistant Comptroller, the Bausch & Lomb Optical Co., Rochester, N. Y., have developed their budget to a very high degree of completeness and usefulness. As space limitation prohibits going into too much detail on some of the phases of our budget preparation and use, I would like to suggest to the readers of this article that a review be made of a complete outline of the budgetary control system which Mr. LaRose has developed in his company. This outline with descriptive forms, etc., appears in the 1931 Year Book of the National Association of Cost Accountants (New York City) and while the system has been improved greatly since 1931, the principles remain unchanged and the outline is worthy of a most careful study.

There are numerous opinions and practices in the placing in the organization of the responsibility for preparation and interpretation of budgetary control. In my opinion, proper placing of this responsibility depends much on the size of the organization and qualifications of its personnel. For comparatively small companies, the chief accounting or financial officer can conveniently prepare all budget schedules. The interpretation can either be left with the person responsible for their preparation or can be handled by one of the major executives as the president, a general manager or ranking vice-president. For organizations large enough to afford a separate department for this work, I strongly recommend such a policy.

If budgets are to serve their greatest usefulness, they must be prepared promptly and under most careful supervision. It is difficult to avoid conflict with regular accounting functions if the complete preparation and interpretation of budgets are assigned to the

accounting personnel. There are also advantages of departmental check accounting vs. budget, and budget vs. accounting departments, when budgets are under a separate department. There must, however, be a close and co-operative contact between the two functions. In our experience, we have found it possible to maintain a business-like but friendly association over a five year period that has been extremely helpful in the efficient performance of the duties of both departments without duplication of effort or personnel. There has never been with us, nor need there be, the slightest overlapping of duties or departmental friction resulting from separation of budget and accounting functions.

There is an old adage that proof of the pudding is in the eating. Applying this theory to our budget control system, we can well and do often ask ourselves many questions, such as:

1. Is our budget plan so much red tape, which we consider advisable to appear up-to-date in modern methods and records?
2. Does our budget control prevent losses, reduce expenses and improve profits?
3. Does our budget control hinder or assist the management with their executive functions and long-range planning?
4. In short, does our budget plan justify its cost?

The answer is "Yes" and would be the same if asked of any of our executives or department heads instead of by one so personally concerned as myself as Budget Director. In principle, the success of a budget control plan depends entirely on the manner in which it is used, regardless of the efficiency and accuracy in which it may be prepared.

Real Meaning of Budget Control

Budget control is not and never can be considered management or even a partial substitute for it. Our budgets are simply a compass prepared and interpreted by the Budget Department and Budget Committee for the assistance and guidance of the men directly responsible for each separate activity.

You may ask the practical question of what do or can we do if results budgeted are not realized. We do not expect actual results to be just what we have anticipated in the budget. There are many individual cases where actual results are below, others above our budgets. The goal is to beat the budget. In the preparation we are careful to project the budget based on past performance plus our best appraisal of the trend in general and specific business conditions. Our comparisons are therefore far more important against the budget than against past performance, although both comparisons are shown on all major statements of results.

Immediately actual results are available comparisons are made against the budget, all important differences are analyzed and reports prepared pointing out the places and reasons for the differences. Emphasis is naturally placed on items which are less favorable than the budget as measured by the profit and loss account and by the balance sheet. In principle, each person having a definite directing responsiblity is supplied with all the necessary details concerning activities for which he has a definite responsibility.

With the facts analyzed, it then becomes an administrative problem to correct any part of the business which gets off the track. More than half of the budget department's time is spent in making studies, developing facts and making recommendations to be used as a basis for improving operations where weak links are found to exist. We find numerous unfavorable conditions which are either impractical or impossible to correct at once. In such cases the facts are made fully known and decision to go ahead, as is, is with full knowledge of existing conditions. Constant reminder and unceasing effort to correct unfavorable situations eventually leads to getting them back into the profit column or to the dropping of a product or a line which the facts show can only continue to be a loser. We have had many items falling into the losing column which have been made profit makers through study and planning.

Measuring Degree of Accuracy

When we measure the accuracy of our budgeting, we find plenty of specific items where actual results vary from our budget by healthy percentages. When we consider the picture from a consolidated viewpoint, we find results do not compare unfavorably with the budget even in spite of the tremendous difficulties under which industry has operated during the past five years.

For example, at this writing (mid-December) I have before me our Consolidated Income Account for eleven months ended November 30th, 1934. This statement shows total net sales differ from the budget for the eleven months by 56/100 of one per cent. and the total of Selling Expenses (including direct selling, warehousing, sales service and market development), administrative expense (including executive and administrative departments, cash discounts, bad debts, etc.), interest, research and patent expenses, reserves for contingencies and federal taxes, less miscellaneous income; differs from the budget by 21/100 of one per cent. In the latter comparison a total sum approaching eight columns of figures is involved.

We do not necessarily consider this closeness of actual expense outlays compared with the budget as an outstanding performance. Our objective is to realize better results than budgeted. This year has witnessed a steady and continuous rise in outlays for all industrial enterprises. Therefore, the results for this particular period do reflect a management task well performed.

In the year 1926, I had the pleasure of completing the first consolidated budget prepared for one of the large industrial companies in the United States. This budget was completed about mid-year based on actual results during the first six months plus budget esti-

mates for the last six months. The balance sheet footings of this company were then about $350,000,000. When the year's results were completed, comparisons showed this first budget to be only a small fraction of one per cent. in error in each, net sales and net income with net income amounting to more than $25,000,000.

These are very favorable examples and cannot be expected to be realized continuously. They do, however, definitely show that reasonable accuracy can be obtained in budget predictions and that results can be favorably influenced by careful budgeting, by eternal vigilance, and through wholehearted co-operation of all members of an organization, be it large or small.

Balance Sheet Budgets

From a balance sheet standpoint, our cash budgets are similarly effective. Inventories, receivables and other working capital items are kept under close control. Plant investment and other permanent outlays are made to fit into the picture in a balanced manner. Any unbalancing is brought to the immediate attention of executives responsible for correction.

Recently, the operating executive of one of our companies told me of an amusing incident which occurred some years ago, at a meeting of key men of his company called by the president to discuss plans preparatory to a visit by me to assist in getting their budgets started. I had written the president of this company (newly acquired) advising him I would like to come out at his earliest convenience to get their budgets under way. The meeting was called, and the first act of the president was to call for a dictionary and to make a careful review of the definition of the word "budgets" before proceeding with the discussion.

It so happens that this company, entirely green on budgets, quickly picked up the art of budget making, and has become one of the best of our performers as well as one of the most enthusiastic of our group in support of budget control. In general, equally good, in some cases better, showings in improved profits and in competitive positions, also in building up cash balances, have been made over a five year period by units which started our present plan of budgeting with no previous knowledge or experience in scientific budgeting. Their success is the result of enthusiastic and willing co-operation.

In operation, the Budget Department and Budget Committee recognize their responsibilities can be carried out only through sincere and earnest efforts to assist each responsible executive to successfully operate the part of the business for which he is directly responsible. Personalities cannot be and are not recognized except on the basis of proven performance. Full advantage of the counsel and recommendations of major executives and other company personnel qualified to advise on specific problems is sought and appreciated. The ideal constantly before the Committee is identical with the one constantly before every employee of the company from the president to the office boy and that is:

1. To render a better service to our customers.
2. To be fair competitors.
3. To provide constantly improved working conditions and friendly relations with our employees.
4. To build earning and equity values on a permanent basis that is fair to stockholders who have invested their savings in our business.

It is only with these ideals constantly before us that our Budget Committee and Department can be of real help in realizing the constructive policies of the Company, as conferred by the stockholders on the Board of Directors, and in turn passed on to executives and committees for carrying out on a constructive and permanent basis.

The Nitration Stage in Celluloid Manufacture

Alexander Parks, of Birmingham, was the discoverer of Celluloid in 1861. *The Chemical Trade Journal,* abstracting a speech on Celluloid made by Foster Sproxton, reports that the nitrocellulose was obtained from cotton and wood cellulose, and although the latter was cheaper, it was low in viscosity (an important function of fibre length) and apt to become brittle in processing, thus producing much waste.

The oldest process is carried on by passing roll tissue paper through a bath of acid and applying hydraulic pressure. Although this process produces the best transparent Celluloid, it is very expensive. There is much scrap, but it can be softened and used again, thus lessening the waste. The second process is the same as that developed in the U. S., being one of centrifuging. In it separate vessels are used for the linters and acid. This process is economical in labor and acid.

In the third process, the linters and acid are put in a pan, on top of which perforated plates are placed and water added. The material is allowed to stand, but the temperature is controlled to avoid a quick rise. It is stabilized by the use of sulfuric acid. The material is then bleached by washing, centrifuging, and dehydrating with alcohol. Then follows the kneading process, which is the central point, because the amount of camphor employed governs the condition of the Celluloid. For example, three pounds of camphor produce a hard Celluloid, while six pounds give a soft Celluloid. At this stage the colors and pigments are added.

The filtration process is next. The hydraulic system consists of two cylinders pivoting on a central pivot (one for low pressure and the other for high pressure) with a pressure of three tons to the square inch, which packs the mass. The filtering material is a fine calico. It is particularly good for retaining the dirt, and while costly, makes the Celluloid of excellent quality. After this comes the pressing process. Here the sheets are compressed under 400 lb. per square inch at 90° C. into solid blocks, cooled, transferred to a slicing machine and cut. Finally, in the seasoning process, the material is put in stoves, warmed, and then heated. The Celluloid shrinks as the alcohol goes off. Both the alcohol and camphor are recovered.

Polishing of the Celluloid is effected in presses under very high pressure; heat is applied and the temperature controlled by the use of several layers of brown paper placed between the plates. The outstanding properties of Celluloid are: inflammability; plastic when hot; elastic when cold; its base is practically colorless; the most delicate colors can be produced in it; and the scrap can be worked up.

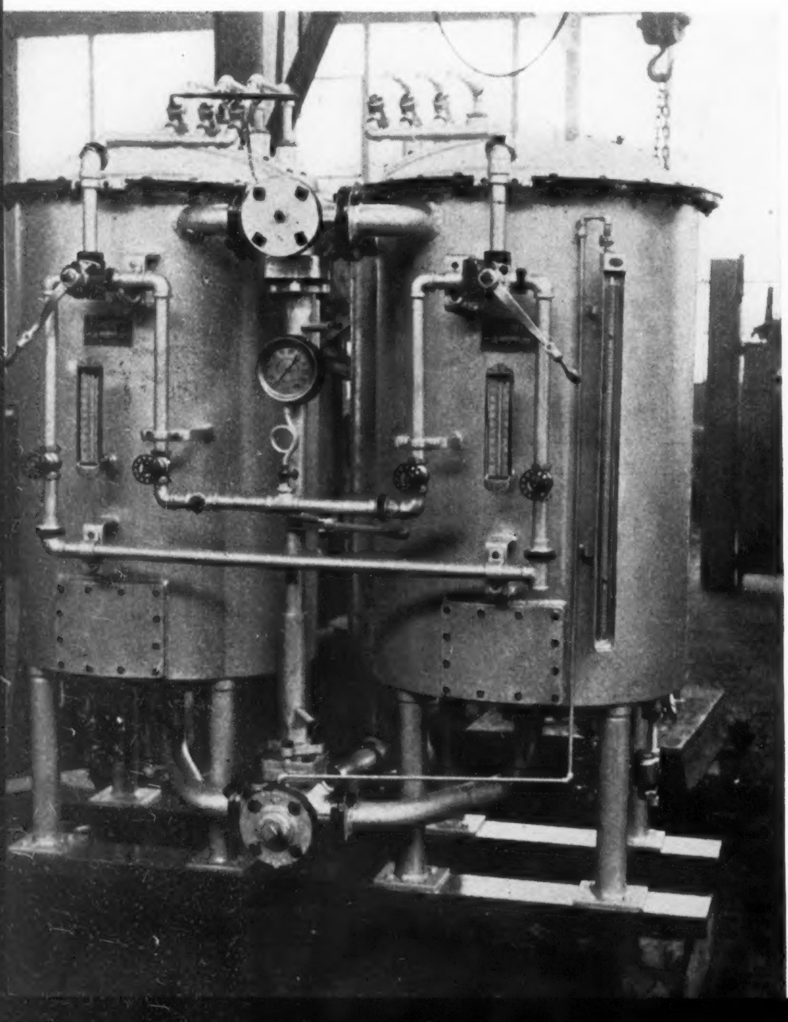
Activated Alumina

By Charles Hardy

ACTIVATED alumina has been developed during the past few years and is finding a market in the metallurgical and chemical fields here, as well as abroad. New applications are being developed continuously and, to keep in step with the new uses, new equipment. The illustration accompanying this article shows one type of equipment now in actual use at chemical and metallurgical plants.

Activated alumina is an aluminous material chemically classified as a partially dehydrated aluminum trihydrate, having a high porosity and a permanent physical structure. In the chemical field it finds its use in the complete removal of water vapor from gases and vapors; for the selective adsorption of certain gases, especially those of the higher boiling points, and as a catalyst or catalyst carrier. A great many installations recently have been made to entirely dry hydrogen, to recondition transformer oils, to produce water-free coal tar derivatives, such as benzol, pyridine, etc., and to produce absolute alcohol.

Activated alumina is finding a wide variety of uses in the chemical field in drying and absorption operations. Photograph shows the "electrodryer" built by Pittsburgh Lectrodryer Corp.



Two patents recently have been issued, namely, U. S. P. 1,985,204, December 18, 1934, to R. B. Derr and C. B. Willmore, and 1,985,205, same date, to R. B. Derr, for "The Production of Anhydrous and Absolute Alcohol."

The variety of applications is perhaps best illustrated by the following classifications, under each of which equipment has been specially built and activated alumina used to advantage:

1. The drying of gases used in controlled atmosphere annealing. Under this group comes particularly the drying of hydrogen and nitrogen mixtures from the cracking of ammonia.
2. The maintenance of lower than normal humidities in special process rooms and storage warehouses. Under this group comes installation to permit a permanent air conditioning in plants where effervescent salts or powders, that are hygroscopic, are packaged. In some cases a 15 per cent. relative humidity is dry enough. This is something that cannot be obtained effectively by the usual refrigeration means for air conditioning.
3. The drying of air for commercial purposes. Under this group a number of applications are found where dry air is necessary; *i.e.*, testing carbon monoxide gas in tunnels, testing refrigerating machinery prior to assembly, besides numerous other applications.
4. Drying gases used in chemical plants. One large organization is drying large quantities of carbon monoxide. Another is drying hydrogen used in a reaction where it was found that the presence of water vapor adversely affected the equilibrium. Another group is the drying of oxygen under 2,000 pounds per square inch and the drying of carbon dioxide for solid CO_2.
5. Breathers for oil tanks and chemical storage vessels.

Other fields include:

1. The drying of certain organic liquids. Benzol, carbon tetrachloride and other organics that contain water in solution, or entrained water can be effectively dried.
2. Recovery processes. Certain organics can be recovered in the vapor phase from streams of gas. This is a highly specific application, however, and depends on the exact nature of the chemical compound involved. Recently an installation was made which has replaced an oil absorption process for the recovery of benzol.

The above gives a general picture of the many applications to which activated alumina is now put in the chemical, as well as in the metallurgical, field. No attempt has been made to elaborate on its chemical and physical characteristics as this phase recently has been dealt with in a special article of the writer's, which appeared in "*Mining and Metallurgy*," November, 1934.

Science and Government

By Lammot du Pont

THIS is truly an "Age of Chemistry" and fortunately one does not have to know anything about chemistry itself in order to enjoy its benefits. Our modern feature writers love to concoct lurid accounts of chemical accomplishments. They ignore the long years of research along specific lines. They overlook the great store of knowledge that has painstakingly been built up as a background for every improvement and chemical discovery. They cater to the medieval notion that research is a sort of black magic, carried on by pallid individuals who work amidst a weird maze of apparatus, brew vile-smelling liquids and gases and pull chemical discoveries out of a test tube, like rabbits out of a hat.

No one wishes to dispel any of the glamour or honor that surrounds the truly scientific worker. His is a field of creative endeavor, with unquestioned fascination; and those who aid in solving any of nature's riddles richly deserve the acclaim of others as well as the personal satisfaction which comes from doing a job thoroughly and well.

I believe that an insight into the procedure followed by the modern industrial chemist will help create a better understanding of his work and a better appreciation of the products which the world enjoys as a result of such work.

Business-like Aims of Research

Research, the foundation of nearly all progress in the chemical industry, is today a most businesslike pursuit, conducted along clearly defined lines with definite objectives in view. Its chief purposes are to improve existing processes and products and, if possible, to develop new ones.

There are two kinds of research: one, "pure" research, the other "applied" research. In the first, the scientist studies various substances in order to increase his store of knowledge about their properties and the laws which govern their combinations. Usually, he has no immediate practical application in view; he is primarily after information.

In the second, he works with a specific objective in mind—he seeks to make his knowledge yield some useful product. After trying every known combination of elements and conditions, he either finds a solution or postpones the investigation until he has some new angle from which to attack the problem again.

The du Pont Company is representative of the chemical industry, and its facilities for research are typical. They have been likened to a river. At the source are scientists studying the structure of molecules and developing basic facts about them. These streamlets of knowledge flow into other laboratories where workers on applied research combine elements in constant search for new products. These branch rivulets, in turn, meet to form the main river of knowledge about materials which, when combined in certain ways, result in products that enrich the world's supply of useful goods.

Information gained through these investigations may be used to cut costs, insure quality and uniformity of the final products, and develop new and related lines of manufacture. Sometimes, this unending quest produces spectacular discoveries, and the public for a brief space of time hears about the dynamic forward march of chemical science.

Most of the time, however, this research work moves onward like a river—silent but unceasing.

Without disturbing valuable processes or products, science constantly seeks improvements. It is a basic principle never to abandon the known for the unknown, and it seems to me that this policy offers a good approach to some of our national problems.

For instance, a paradoxical situation has developed in the efforts to stimulate recovery through abandonment of old principles and adoption of new, without thorough examination and test in the light of all available knowledge.

Competitive Government Projects

The Government, with one hand, has overloaded business with restrictions and in some cases threatened to destroy private property by setting up competitive projects. Such uncertainty about the future does not help established industries to recover, or new industries to get started.

With the other hand, the Government has made or committed itself to unprecedented expenditures, the cost of which must be borne largely by those very businesses already overburdened.

Now, there is one fact that is an almost obvious truth, but which is often overlooked: the Government is dependent for its very existence upon the income derived from individuals and from business.

Not only must business, both individual and corporate, be encouraged to expand so that it can absorb more and more labor, but it must be permitted to operate on a profitable basis, so that it can have income with which to pay taxes.

Today, the cost of all Governmental activities consumes between 35 and 40 per cent. of the national income. The prospect is that it will go even higher.

If taxes go too high, industry will have to raise the price of its products; and when prices go up, the standard of living goes down. People are not able to buy as much as they want or need. Then demand falls off and factories close. Then we find ourselves in a vicious spiral, similar to that which carried us all down before.

Therefore, it is vital that established business enterprises be encouraged to operate on a profitable basis by keeping taxation within bounds and by letting it be known what the nature and extent of the tax burden is going to be.

This also applies to new business enterprises. The money required to launch a new venture can only come from the funds which other companies or individuals are able to accumulate over and above their operating and maintenance expenses. If such funds are taxed to too great a degree, it is virtually impossible to expand established industries or to start new ones. On the other hand, if new enterprise is encouraged, it will increase activity and take up some of the slack in employment. This, in turn, relieves the Government of a proportionate part of the relief problem.

Final Effect of Government in Business

So you see how the Government is virtually a partner and really dependent on every business activity. If business is able to operate successfully; that is, have some margin after all operating costs are paid for, then the Government has something on which to draw. Due to increasing costs and the maze of restrictions placed upon business in the immediate past, many business men became discouraged and were either forced or decided to quit operating. Every time a situation like that happens it hurts our country in two ways: First, it throws more people out of work and forces another adjustment in the re-employment problem; and second, it reduces the Government's source of income, both from the taxes on the business itself and on the individuals who derived wages, salaries or income from that business.

That is why the subject of increased taxes is of such vital importance to all of us. At the present time it is estimated that the amount being spent by all of our public bodies amounts to about $420 per year for each individual that is gainfully employed. Or, to put it another way, out of every five-day week, you work almost two days to earn the money you pay out in taxes to various governmental bodies.

It is essential, therefore, that all projects not vital to the relief of current distress or to the re-adjustment of industry in such a way as to absorb workers, should be postponed until we have made further recovery. Then we can safely review our progress and, after due examination of new proposals, decide, just as is done in the chemical laboratory, what next move is best for the well being and happiness of the American people.

Industry's Bookshelf

Progress of Uprise in Chemistry, Volume XVIII, 1933, 770 p. Society of Chemical Industry, London, 12s. 6d.

As usual the British summary which corresponds to our American survey of chemistry makes us more than a little envious. Its scope is much broader and includes a survey of international progress, hence it is much more complete and comprehensive and due, we expect, to more painstaking editing. The material is more attractively and logically presented. This is an invaluable book to those who wish to keep abreast of the new developments in applied chemistry.

History of Food Adulteration and Analysis, by Frederick A. Filby, 269 pages. George Allen and Unwin (London), 10s.

A pioneer work of more than usual general interest since it weaves together most skillfully the development of applied organic chemistry, the law, and a great fund of entertaining facts.

The Study of Raw Materials, by Brooks Emeny, 202 pages. MacMillan Co. $3.00.

Splendidly illustrated by maps and charts, carefully documented, here is a very valuable source-book for industrialists, army officers, and lawmakers. The chapter on manganese has a more than timely interest, and there is hardly a page that does not have particular meaning to the chemical industry.

The Economic Resources of Australia, by H. L. Harris, 125 pages. Angus & Robertson, Ltd., Sydney, Australia. 3s.6d.

To those in this country who are selling to Australia or contemplate doing so, or to those in any way interested in the economic resources, this interesting review will prove invaluable in providing a background of actual conditions.

The Natural Organic Tannins, by M. Nierenstein, 319 pages. J. & A. Churchill, Ltd., 40 Gloucester Place, London, England. 21s.

A comprehensive compilation into one volume of the scattered scientific knowledge of the various tannins. The writer has spent the past 30 years in investigations of the various tanstuffs and has collaborated with many of the leaders in this field for many years. The book fills a long-felt want in literature.

Henley's Twentieth Century Book of Formulas, Processes and Trade Secrets, 809 pages. The Norman W. Henley Publishing Co., 2 W. 45th st., N. Y. City. $4.00.

This highly regarded formula book has been completely revised, older formulas have been replaced with more modern data, a section has been added giving useful information about the products called for in the books and the Buyers' Guide section has been greatly enlarged.

Chemical Kinetics And Chain Reactions, by N. Semenoff, 480 pages. Oxford University Press, 114 5th Avenue, N. Y. City. $10.50.

This is the 9th volume of the *International Series of Monographs on Physics*. The work is divided into 4 parts, with a final summary of results. In Part I the general principles of the chain theory are outlined, together with the simple mathematical apparatus involved. Parts II-IV contain a comparatively detailed analysis of the experimental data on the kinetics of nearly 50 chemical reactions, which are interpreted on the basis of the theory developed in Part I. In the summary the author gives a general review of the main conclusions arrived at. More than half of the results reported in the book relate to the last 4 years, during which a great deal of work has been done both in America and Europe, especially in the U. S. S. R.

Competition in Chemical Services

By Louis Weisberg

THE case of the consulting chemists and chemical engineers is only a minor example of the Government's encroachment on private enterprise, but it illustrates as clearly as any the principles involved. This group ranks among those who receive the highest rates of remuneration paid to the chemical profession, and they have done much to elevate and maintain professional standards. Being engaged in independent practice, they combine the scientific point of view with that of the independent business man. It is not surprising to find such a group looking ahead and ready to oppose vigorously what they consider unfair competition.

Senator Clark's recently introduced bill to establish a procedure for cost accounting for federal agencies will hardly eliminate Government competition. It is however, a considerable improvement over the Shannon bill introduced in the House about three years ago. At the time the Shannon committee was considering this bill, the Association of Consulting Chemists and Chemical Engineers collected and submitted material involving a number of instances of unfair competition. In most cases, it was the independent laboratory rather than the consultant that was most affected by this kind of competition.

One example cited at that time was the policy of the Bureau of Mines with respect to making coal analyses for parties other than the Government. The Bureau itself was not quite sure what the policy should be, but at any rate it did state (Schedule 3B) that analyses for private parties could be undertaken by the Bureau "where good reason exists why such analyses should be made in a Government laboratory, as in cases where the coals are to be exported for sale in other countries, or in cases involving arbitration, etc." The Association took issue with this position and contended that there is no good reason in these cases why the analyses should be made in a Government laboratory. There are reputable private analysts equipped and qualified to make coal analyses as well as the Bureau of Mines, and it is a fact that they have been doing this work adequately and properly in cases where coal is to be exported and where arbitration is involved. Why should the Bureau take this work away from them, when the public interest is in no way served by such activity on its part?

If the Bureau were required to take all proper costs into account, including fixed charges on its investment in equipment and the taxes it would have to pay were it not a public institution, it could probably make these analyses no cheaper than private laboratories properly equipped for and experienced in this type of work. Even if the Bureau charged a fee at least as high as the private laboratories, there is still no good reason why it should compete with them. These laboratories pay taxes which in part help to defray the expenses of the Bureau, and which therefore constitute in effect a subsidy to an already powerful competitor.

Why should any taxpayer be required to support a competitive Government activity, which in the long run is bound seriously to affect his ability to continue paying taxes? It is not fair and it is not sound policy, unless the intention is to make that form of private enterprise so unprofitable that it cannot continue to exist.

The matter of coal analyses by the Bureau of Mines was only one of a number of examples of unfair competition by the Government laid before the Shannon committee by the Association of Consulting Chemists & Chemical Engineers, Inc. Some of these situations have been clarified and corrected, but the absence of a clear cut policy concerning the limits to Government competition makes it inevitable for cases of unfair competition to keep arising.

A fruitful source of difficulty comes from the desire of practically every department head to expand his department to obtain increased appropriations. By giving practically free service to some interests, support for the department's requests may be obtained. Any one who has observed the extent to which small vocal groups are able to influence legislation will realize how successful trading for favor in this manner can become when carried on by someone familiar with the technic.

Senator Clark's bill would help to make it more difficult for Government agencies to curry favor in this way. At the same time, Government service would become less attractive if it had to be paid for on the

basis of its actual cost. In many cases, it would no doubt be more expensive than similar service obtainable through private channels.

It is not to be supposed, however, that Government competition becomes unobjectionable by reason of its being paid for at full value. The only justification for any Government service is that it can serve the public interest better than private enterprise. How can the public good be better served than to let the Government do those things which it can do more efficiently than private enterprise and to let private enterprise in turn do those things which it can do best?

It is not fair to private business that the two should meet in competition. Even though the Government does not pay taxes, they are properly a part of the cost of operating Governmental agencies, since competition of the Government with private enterprise must inevitably reduce the taxes received from business. It is encouraging to note that Senator Clark makes special mention of taxes and requires that they be included in the final cost figures.

While there may be some doubt as to how effective the language of Senator Clark's bill may be in putting an end to unfair competition by the Government, its passage would undoubtedly strengthen the hands of those who seek to prevent further encroachment by the Government on legitimate private enterprise. And perhaps it is not too much to hope that limiting the use of funds raised by taxation to strictly public purposes may help to lower the heavy burden of taxes under which all of us are now staggering.

This brings up another kind of unfair competition which the consulting chemists are fighting. The Government has not been the only one to use public funds in this manner. A number of universities and institutions, supported in whole or in part by taxes, either directly through contributions from public funds or indirectly through tax exemption, have been even more flagrant offenders than the Government. Some of them have solicited work with as much energy as they have solicited endowment. Sometimes these services have been used as bait for endowment. It has not been a casual matter with them but a settled official policy.

To name these institutions, among which are included not a few of the most prominent, would serve no useful interest here. It should be made clear that objection is not taken to the acceptance of consulting work by members of the staff of such institutions under proper conditions. These conditions are that consulting work should not interfere with academic duties, the name of the institution should not be used, and the bill rendered should include a proper charge for overhead and for the institutional facilities used.

Institutions of this type should realize that they are putting themselves into direct competition with their own graduates. Under these circumstances how can they expect the continued support of the alumni thus in competition with their own alma mater? Both as taxpayers and alumni they have valid objections. Institutions depending on private endowment are perhaps more sensitive to the feelings of the alumni than tax supported schools. Many of the latter, too, engage in various forms of service to gain the support of special groups. Here again the broad public interest is sacrificed to influential special interests.

Chemists and chemical engineers in independent practice cannot hope to accomplish anything along this line single handed. They must stand together with their fellow consultants and work through some kind of organization that can produce effective pressure and keep up a persistent fight against encroachment by Governmental agencies, universities and similar institutions. This work of this Association, however, does more than serve the private ends of its members. It is plainly in the public interest. All taxpayers stand to benefit through it. The issues of public policy involved are among the most important that will have to be decided during the next few years.

Chrome Ore Mining

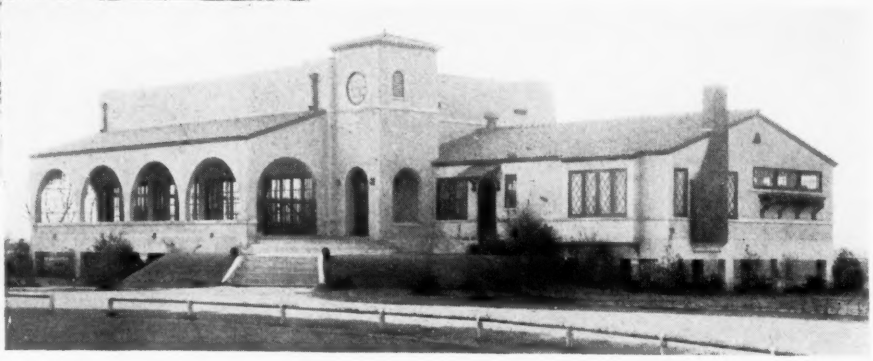
The peak world production of chrome ore in post-war years was in 1929, when the total raised was 590,000 tons. With the international industrial depression of the following years, output naturally declined until in 1932 it had fallen to the level of only 295,000 tons. The figures for 1933, however, show a very distinct recovery. The Imperial Institute in their Statistical Summary of the world mineral industry, and published in *The Chemical Trade Journal*, give the 1933 world output of chrome ore as 273,000 tons. Actually, the figure is considerably larger, as the total just given does not include the Russian output. The quantity of chrome ore raised in Russia was about 111,000 tons, the increase having been steadily progressive since the 28,000 tons of 1929. Adding this Russian figure, world output of chrome ore in 1933 is seen to have reached 385,000 tons, or nearly two-thirds of the record output of 1929, for which year the Imperial Institute figures did include the Russian mineral.

A further factor which has contributed to last year's better results was Turkey, where the output of chrome ore mounted to 74,188 tons from the 54,344 tons of 1932 and the 24,981 tons of 1931. The production figure for Greece is not available, but was probably only small, since the quantity raised in 1932 in Greece was only 1,530 tons, and the tendency has been a declining one for several years. New Caledonian output of chrome ore has also been on the down grade, the figure for 1933 being 49,100 tons against the 68,332 tons of 1932. French Indo-China has been out of the market since 1931, while Japan with its 14,800 tons last year is not an exporting country. Cuba is becoming a fairly important source of chrome ore, producing, in 1933, 21,837 tons and exporting 15,576 tons. The U. S. A. is singularly devoid of commercially-exploitable chrome-ore resources, its output in 1933 being only 380 tons. Jugo-Slavia was responsible for raising 25,062 tons and for exporting 18,855 tons this same year, while small quantities are also mined in Norway. In regard to the British Empire the principal source of supply of chrome ore remains Southern Rhodesia, which was responsible for 34,493 tons in 1933. The Union of South Africa, however, is rapidly overhauling its northern neighbor, mining 33,541 tons of chrome ore in 1933. The Indian figure was 15,526 tons, while a newcomer to Empire supplies is Australia, which has increased its output from 26 tons in 1931 to 891 tons in 1933. It is probable that this year's figure will show a material increase over 1933, for consumption of chrome ore has increased by about 50 per cent. on 1933. Mining in Africa and India is on a more extensive scale, while relatively large increases in chrome-ore output during the current year are reported from Cuba, the Philippines, and New Caledonia.

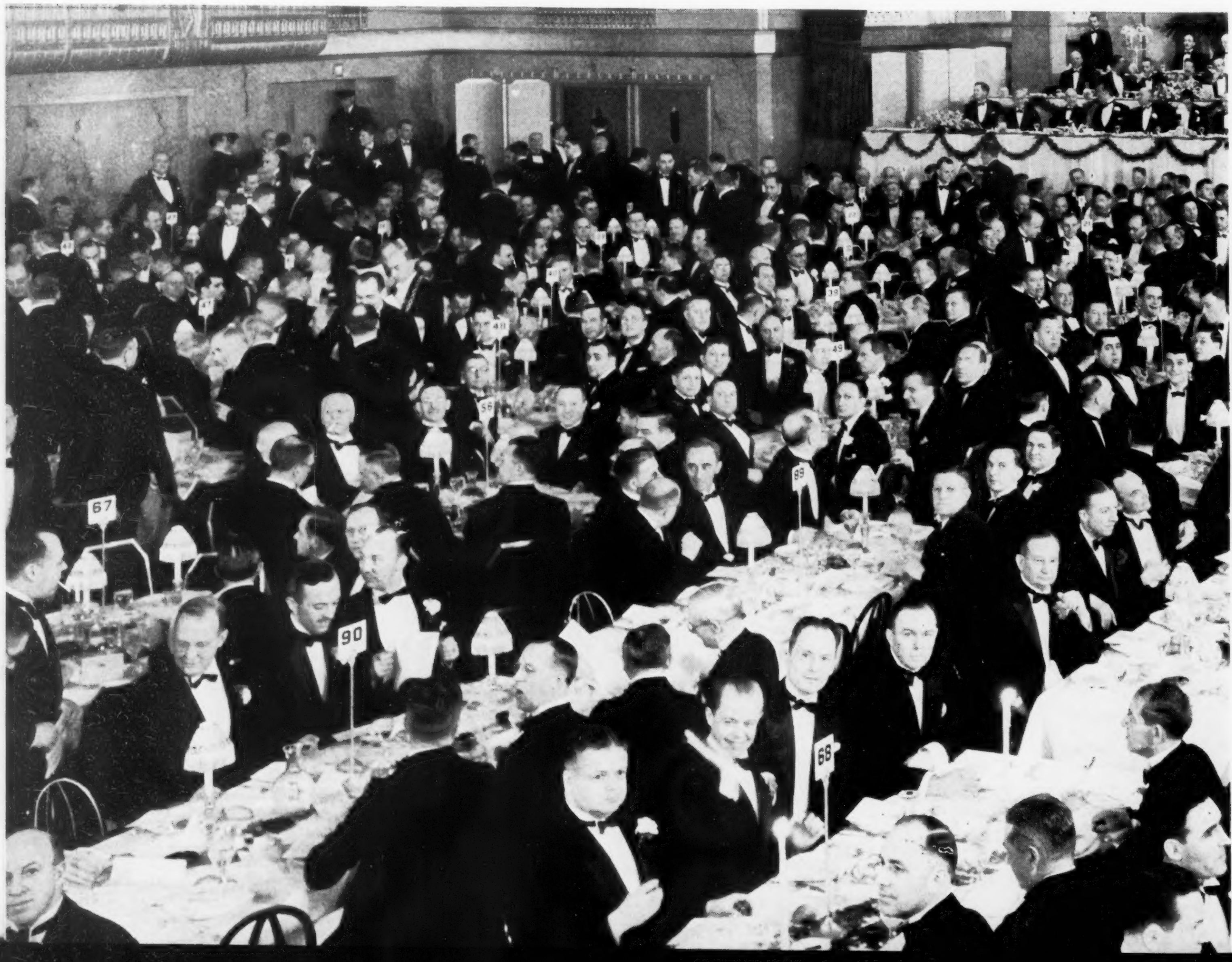
CHEMICAL

The Photographic Record

With the golf season coming along, chemical golfers will be interested in these two golf clubs located at opposite ends of the country, one at left at Midland, Michigan, the other (below) at Newgulf, Texas, being golf headquarters for the Dow Chemical Company, and the Texas Gulf Sulphur Company, respectively.

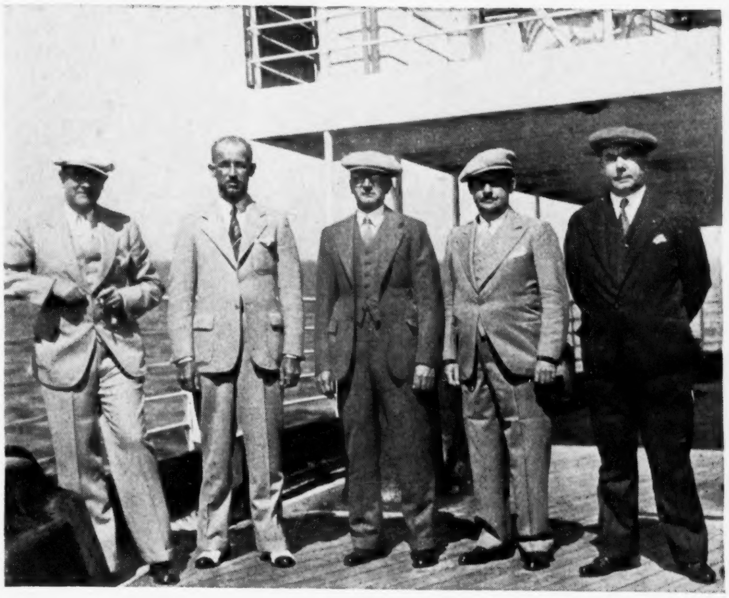


Lower left and right, Tenth Annual Dinner of the Drug, Chemical and Allied Sections, New York Board of Trade, held at Waldorf-Astoria, attracts over 1500, exceeding last year's outstanding record of 1200. Guest speaker, Senator Joseph T. Robinson, majority leader of the Senate, aroused the group with a scathing denunciation of Senator "Huey" Long and his share-the-wealth plan and the Townsend old age pension bill.

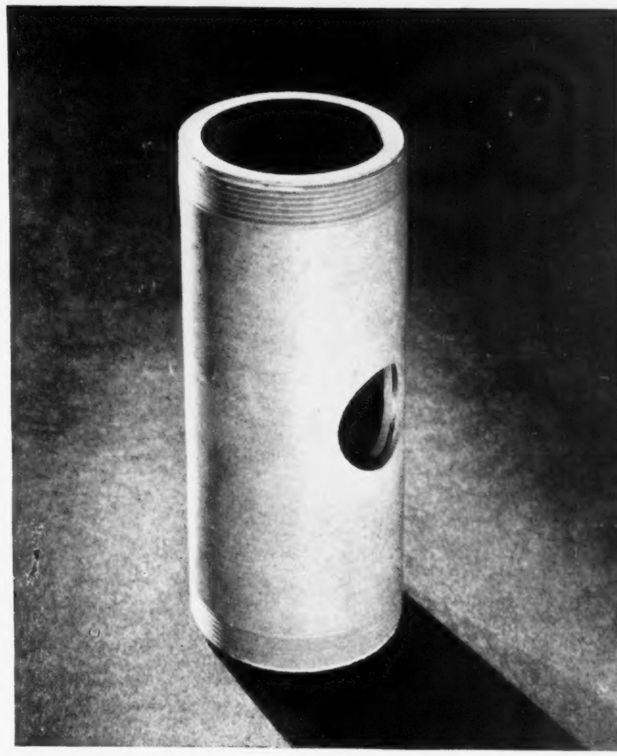


NEWS REEL

of Our Chemical Activities



A group of chemical executives, who whiled away the time from February 26 to March 17 on a West Indies cruise, shown on board the "S. S. Britannic." Left to right, George S. Cooper (Prior Chemical Corp.), H. M. Harker (Monsanto Chemical Co.), G. A. Geiger (Givaudan-Delawanna, Inc.), J. P. Sullivan (Grasselli Chemical Co.), and A. C. Meyer (Meyer Bros. Drug Co.).



A new X-ray shield developed by Joseph C. Rah & Company in which Bakelite Laminated was used in place of other types of materials because it acts as a good insulator. Shield is designed for portable shock-proof X-ray equipment for industrial purposes, such as X-raying castings and joints.

New Products and Processes

A Digest of the Current Literature for the User of Chemicals

Anti-Corrosive Steel Substances

By Francis M. Hartley

Unprotected steel exposed to any ordinary atmosphere will rust and corrode. Corrosion is accelerated by moisture, heat and various corrosive agencies, such as salt spray, brine drip, gases from coal fires, and so forth.

Regardless of what theory of corrosion one accepts or believes in, the outstanding fact of the matter is that in order to prevent corrosion from taking place it is necessary to cover the steel with a protective material that will hermetically seal the surface of the steel against the action of everything that causes rust or corrosion to develop. The commonly used surface protection is paint.

A knowledge of the composition of a paint is of primary importance in enabling the buyer to judge for himself in advance whether or not a paint is suitable for the purpose for which it is offered. The buyer is entitled to know what a paint will do *before* instead of *after* he has used it. If the composition of the paint is unknown to him, he cannot appraise its true value and worth. Under such circumstances the natural and justified inclination of those in charge of painting operations is to turn to materials of which the composition and proportions are known and those in particular which have stood the test of time on jobs on which accurate data are available.

In making a metal-protective paint, no pigment should be used which will either form water-soluble compounds or promote chemical action within the dried paint film. Chemical action always involves change in volume, and such changes set up stresses within the film, which tend to disintegrate it. Soluble compounds, when they wash out, leave the binder porous and without protection. They may also carry additional solid material away with them, thus further impairing the film. Besides having no harmful effect on the vehicle, the pigment should have no tendency toward a harmful effect on the metal, which it is expected to protect. Sulfide pigments, for instance, should not be used in paints for metal, because compounds may be produced which will stimulate corrosion. Only opaque pigments should be selected which will give hardness and toughness to the dried film and protect it from destructive influences. Inerts should not be used because they are transparent and hence open up the film to light. Their presence enables the sun to destroy the vehicle prematurely. The pigment may or may not add much to the moisture-proof qualities of the film produced. The ability to shed moisture is one of the factors which determine the ultimate life of the coating.

It is generally believed at the present time by competent paint technologists that there should be about 30% by volume of opaque pigment in the dried paint film of the priming coat for maximum durability. This means that a gallon of red-lead paint should contain at least 20 pounds of dry red-lead. For a durable chromate primer it means about 15½ pounds of basic lead chromate in a gallon of paint, notwithstanding the fact that there are on the market chromate primers which contain only one or two pounds of lead chromate. In reality, these are iron-oxide paints to which a small amount of lead chromate has been added for a sales talking point. This brings us to a consideration of the inhibition theory of corrosion.

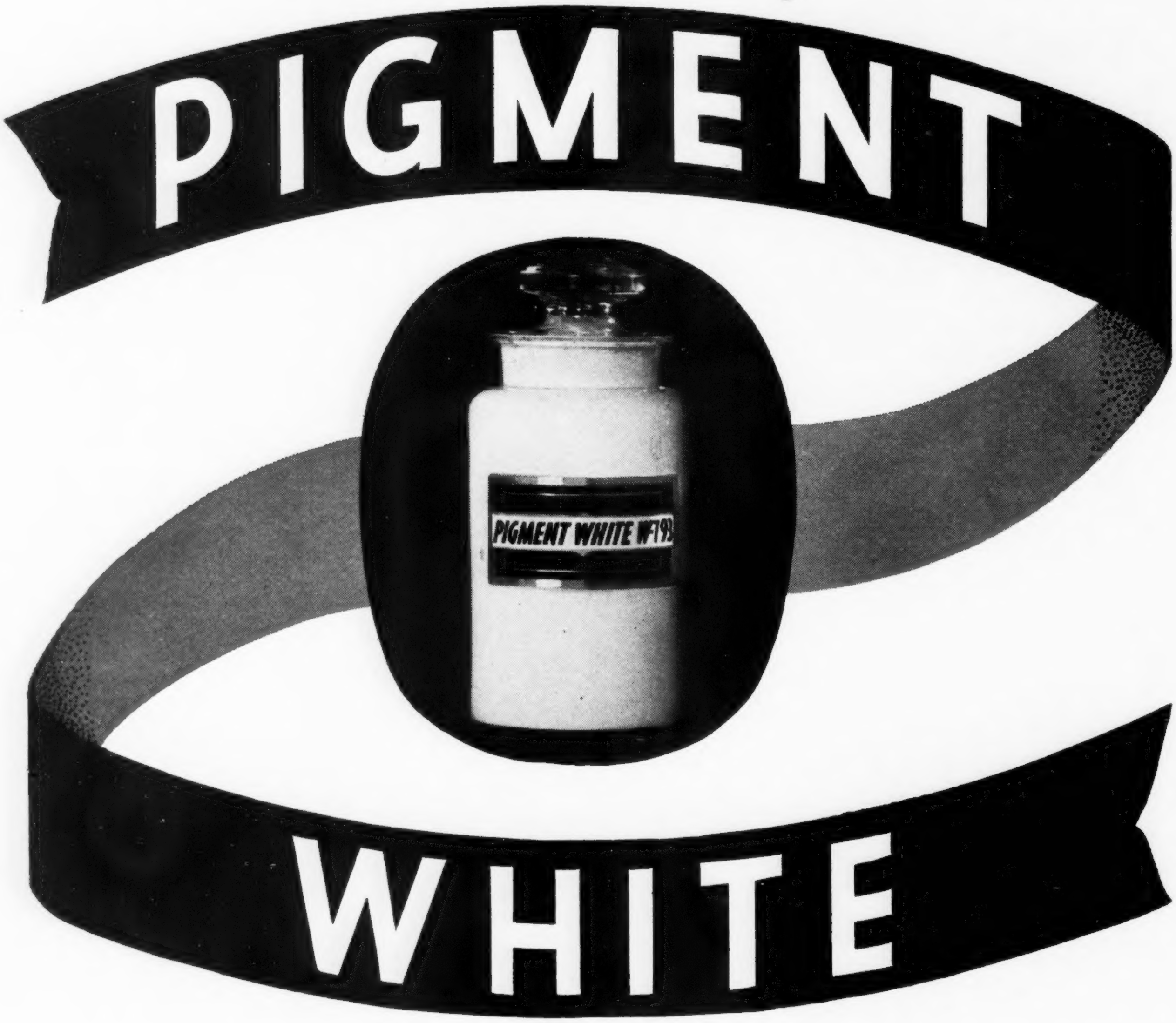
For some time there has been a great deal of discussion regarding the ability of chromate pigments to inhibit corrosion of steel when used in paint films. We believe that the inhibition plays a small part in the anti-corrosive qualities of a paint film, because if a paint film disintegrated to such an extent that the pigment could dissolve in water and thus inhibit corrosion, the general surface of the metal would be so open to the atmosphere because of the failure of the paint film that corrosion would proceed at a fast rate. This same reasoning applies to the formation of chromic acid. If the paint film has disintegrated to such an extent that acids can form chromic acid with soluble chromates, corrosion will take place and the anti-corrosive or pacifying effect of the chromic acid will be relatively small.

The addition of lead chromate, red-lead or other lead pigments to iron-oxide paints will undoubtedly improve them, but the simultaneous introduction of an equal or greater volume of inert extending pigment will probably more than neutralize the beneficial effect of the addition of the good pigment. An examination and analysis of the so-called chromate primers that are now on the market will show that many of these paints consist largely of oxide of iron and cheap extender pigments. Although iron-oxide pigments possess great spreading power and opacity and paints made from them are cheaper than red-lead paints, they are, however, variable in quality and apt to contain corrosive basic sulfates of iron, and so promote corrosion, which it is their only object to prevent. Red-lead, on the other hand, is a very dense pigment and the paint made from it dries with a hard and impervious film, which is practically water-proof and hence keeps out the weather to an unusual degree.

How many pounds of red-lead should be mixed with one gallon of linseed oil? The answer to this question depends upon what one expects from the resulting paint in the way of service.

For a number of years leading paint technologists have been trying to determine the approximate volume relationship between pigment and oil, at which maximum durability of the coating is obtained. Many tests have been made, or are under way. Among the recent and most authoritative is the one now being conducted by the National Bureau of Standards in Washington. So far this test definitely shows that the pigment should occupy at least 30 or more per cent. of the volume of the dried paint film. This is equivalent to a mixture of at least 30 or more pounds of dry red-lead to one gallon of linseed oil and hence it confirms our often-expressed belief in the value of more heavily pigmented paints for increased durability and longer life.

The New and Improved



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● You can forever banish dull grayish whites with our new snow-white pigment now available in either paste or powder form. It is prepared for use with any natural gum, starch or starch-tragacanth thickener, for printing synthetics, silk, cotton and wool.

PIGMENT WHITE W-793 H is a smooth paste, entirely free from grit. Its highly suspended pigments give a free-flowing body to the printing paste and its greater covering power guarantees brilliant whites.

MONOCHROME is the fine, highly pulverized, fluffy powder form of pigment white.

Both the paste and powder mix thoroughly with any other printing ingredient and will not stick in the engraving.

FREE—Write today for your free samples. Make the thumb and finger test—prove to your own satisfaction that these new pigment whites are free from grit and will give you the whitest whites you have ever printed.

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Red-lead has been successfully used for years. It has protected all kinds and types of structures from corrosion and has excelled in all fairly conducted tests. Because of the super-eminent service that it gives, red-lead has come to be known as the standard preservative for iron and steel surfaces.—Abstracted from *The Dutch Boy Quarterly*, Number 1, 1935.

Coatings

A uniform jet black finish for all grades of common iron or steel has been perfected by the Alrose Chemical Co., 80 Clifford st., Providence, R. I., and is being offered under the name "Jetal." Process comprises immersion in an aqueous bath at a comparatively low temperature for about five minutes. No plating, spraying or baking are required, and the finish does not chip, scale, peel or discolor.

Metals and Alloys

Unusual resistance to atmospheric corrosion and good impact strength, which is maintained at low temperatures, are important features of some low alloy steels. When Alfred M. Steuding, chief engineer, U. S. Steel Corporation, addressed the Montreal Chapter of the American Society for Metals, on "Low Alloy and High Tension Steels," he dealt mainly with those containing small amounts of potassium.

Tests carried out by the Carnegie Steel Company some years ago to determine the effect of potassium on steel showed that it has the same hardening or strengthening effect as carbon. These tests also showed that different results are obtained from identical samples of steels and alloys tested at different seasons and in different atmospheres. Rural atmospheres, only ten or twelve miles outside of the city, cause much less corrosion. As little as 1/100 of 1% potassium in steel, with small amounts of chromium, copper and silicon, and traces of manganese and sulfur, considerably increase its resistance to atmospheric and certain other natural types of corrosion.

While these low alloy steels cannot be ranked with high alloy or stainless steels, they are more suitable than plain carbon steels in many cases. Their chief use at present is in transportation equipment, due to the ease with which they can be punched, machined, flanged and pressed. Their rivet shearing strength and bearing strength are much better than those of plain steels and they can be easily welded.—*Canadian Chemistry and Metallurgy*, 32, (48) February, 1935, Metallurgical Section.

Paper

A study of the action of liquids on cellulose by two chemists was recently published in *Papierfabrikant* and abstracted in *Paper Making & Paper Selling*. After measuring the height of absorption on strips of cellulose dipped in water, glycerine, oils, petrol, acids and coloring matters their conclusions were: That the viscosity of the liquid has a great influence on the result. The humidity of the cellulose between wide limits .4% to 21%, has no appreciable influence on the height of absorption. This height or degree may serve as an index of the greasiness of the pulp and its capillary properties.

French Sizing Process

A change in the method of sizing papers and boards, insofar as the transformation of rosin into size ready for the beaters is obtained entirely in the cold state, has been effected abroad and the complete process given in *Paper Making & Paper Selling*, March, '35, p62. This work was undertaken because the saponification of rosin with sodium carbonate is not entirely satisfactory and led to the discovery that a weak solution of caustic soda will combine with rosin at normal temperatures, in such a manner as to give a very fine dispersion of the rosin. Various concentrations of sodium hydroxide were used, the best results being obtained by using a half of one per cent. caustic solution. At this concentration and at a minimum temperature of 60° F., a completely saturated solution of rosin at a strength of 4% is obtained, the rosin being in an extremely fine state of dispersion. Method is termed the Delthirna sizing process.

Introducing Color in Paper Manufacture

Clouding or uneven coloring frequently occurs when direct or basic colors are added to unbleached sulfite pulp in the beater. The color is fixed too rapidly on the pulp that meets it first, consequently beating cannot produce a completely homogeneous tint. In the *Wochenblatt fur Papierfabrikation* a simple method of overcoming this difficulty is given. The coloring matter solution is put into a basin placed on the beater by the side of the cylinder. An injector actuated by water under pressure sucks up this solution and injects it diluted with water on the line of contact between the cylinder and the pulp. The spurt of color is regulated so that all the dyestuff is introduced during a turn of the pulp in the beater. The result is a level dyeing.—*Paper Making & Paper Selling*, March, 1935, p73.

Textiles

Latest products of General Dyestuff include: Anthra Cyanine Violet 4B, a new level dyeing acid color, producing bright violet shades of better fastness to light than the ordinary acid violets. May be used in brightening the wool in dyeing shoddy, etc. Is also suitable for dyeing pure silk and silk-wool fabrics. Diazo Brilliant Blue BBLA, a developed color of a very bright greenish blue. Useful for discharge work and for dyeing mixed fabrics of cotton and rayon the same tone. Product also leaves acetate silk clean. Rapidogen Bordeaux IB, which produces a deep, bluish bordeaux shade of very good fastness to light and washing, as well as good fastness to chlorine. Indanthren Yellow 6GD Suprafix DBL, the brightest, greenest available Vat Printing Yellow, which surpasses their Algol Yellow GCA in fastness to light. Fastusol Brown L3RA, a direct dyestuff claimed to possess excellent fastness to acid and alkali; leaves acetate silk white and stains real silk slightly from a neutral bath. Developer ORB, a new developer for acetate silk dyeing which produces a dischargeable orange shade with Cellitazol ORB. Rapidogen Yellow 13G and Rapidogen Scarlet 1L. The former represents the brightest, greenest yellow of this class, and possesses excellent fastness to light. The latter is brighter, yellower than their Rapidogen Scarlet R and also faster to light. Both are bright colored resist dyestuffs of good yield for aniline black and Indigosol resist styles. Wool Blue GN Extra, a new acid color of the I. G. range, which dyed from a Glauber's salt-acetic acid bath produces bright greenish blue shades, of only moderate fastness to light. Recommended for brightening the wool in union dyeing. Has good affinity for pure and tin-weighted silk, and produces uniform shades on silk-woolen mixed goods.

Urea in Printing Pastes

The incorporation of urea in a printing paste containing vat colors, results in fuller-bodied shades being obtained. It is widely used on the Continent for calico printing and its use is described in French Patent 681,566. *The Chemical Trade Journal* (London) states that the urea for this purpose is marketed as "Renforcateur Ciba."

Another urea product also reported is "D. H. Fixer," covered

by German Patent 528,262, produced by Durand-Huguenin Company, who found that by adding urea to printing pastes containing chrome colors, increasing if necessary the proportion of mordant, that there is a better fixation of the mordant, while a shorter time of steaming is needed, and the printings are brighter and faster to soap. This firm has also found that by the use of urea it is possible to employ the natural gums in printing chrome colors on silk.

A mixture of urea and ammonium thiocyanate is sold for this purpose under the name "Débagène S". German Patent 558,832, issued to Fabrik Chemische Produkten Holtmann, outlines the use of urea in the direct printing of acid colors on wool, or in the printing of acid and basic colors on silk. Better fixation is also noted. German Patents 512,399 and 519,983 of the I. G. cover the reduction of the lustre of acetate rayon by printing with urea and subsequently steaming. This last product is sold as "Opalogen A."

Aluminum Sulfate

Tests at the U. S. Bureau of Standards reveal the fact that aluminum sulfate can be used as an excellent preservative for silk stockings. Treatment, which is claimed to considerably increase the strength of the materials, consists of dipping new stockings in a hot solution of about 3% aluminum sulfate; afterwards drying them, then washing gently.

Silk Waterproof Material

A pure silk, completely waterproof material, which contains no rubber, bearing the name "Delio" is being processed by Westinghouse. It is also claimed to be acidproof, heatproof and will not stick, crack, harden or deteriorate with age. It is lightweight, translucent, and available in a wide color range.

Colloidal Gums

Several new and unusual types of colloidal gums for the textile and paper industry are being offered by Industrial Emulsions, Inc., of Passaic, N. J., manufacturers and importers of physico-chemical products. INDEGUM is a pure white powder with a pH of approximately 7, possessing extremely high viscosity in water solution; a 2% solution is practically of zero fluidity. GUM AQUATITE dissolves readily in water, but the deposited film, when dried, is highly resistant to re-dissolving. INDALGIN is an unusual binder and protective colloid of alginic derivation.

Miscellaneous

A blend of linseed oil and China wood oil in proportion of 85% to 15%, tested in the research laboratories of Spencer Kellogg and Sons, has resulted in a new special oil of unusual characteristics, known to the trade as Superior "CW." In creating this oil the laboratory overcame the emulsifying tendency of China wood oil and the finished blend is neutral, having the same characteristics as Kellogg's Superior Varnish Oil but bodying more rapidly under heat and producing a harder film.

Differences in Kaolin

An investigation of American kaolins has recently been made to supplement a similar investigation of English china clays. The aim was to determine the differences between American and English clays which might affect the substitution of the former for the latter in whiteware bodies, and if possible to find the reasons for these differences. Various properties of nine American kaolins were determined. This investigation was made by the U. S. Bureau of Standards and the facts herewith given are abstracted from *The Chemical Trade Journal*, London.

It was found that these clays could be divided conveniently into a group of primary clays and two groups of secondary clays. The chief cause of differences in properties of English china clays and comparable American kaolins was found to be their differing equivalent mineral compositions. The properties affected most are refractoriness, strength, shrinkage, and porosity of heat-treated specimens, and thermal expansion of specimens heated to certain temperatures. These properties differ because of the smaller amount of fluxing constituents in American clays as compared with English clays. English clays differ in color from most of the comparable American ones, because of the greater titanium content of the latter. It was found that, by adding fluxes to American kaolins and kaolin blends, mixtures with properties closely simulating those of English china clays could be produced. It should be possible, with proper selection of domestic materials, to make a complete substitution for English china clays in whiteware bodies, with negligible attendant changes in the properties of the bodies.

Thermoplastic Molding Powder

A granular thermoplastic molding powder, "Leukon," has been introduced to the trade by the I. C. I. This synthetic resin may be subjected to either compression or injection molding. *The Chemical Age* points out that the density is about 1.2 at 20° C., 10% less than ordinary phenol formaldehyde Bakelite types of molding powders, and 20% less than the amino types, such as Beetle, Pollopas, etc., and about 1/7th the weight of copper or brass. It is insoluble in water, alcohol and aqueous media; unaffected by acids or alkalies up to concentrations of 40% in the case of sulfuric acid and of caustic soda at atmospheric temperatures; is also unaffected by many high-boiling organic esters, but soluble in certain of its forms in a number of organic solvents, which include acetone, chlorinated hydrocarbons and benzene.

Preparation Graphite Foil and Mirrors

An improvement in this process employs a special colloidal solution of graphitic acid, which is gradually transformed into graphite at a temperature of 100 to 200° C. under certain conditions which ensure the formation not only of lustrous layers but also of a mirror-like surface—(*Chemiker-Zeitung.*)

Boric Acid Preservative in Transporting Fish

When frozen fish are transported in the unprotected state, there is a rapid loss of moisture from the fish to the refrigeration pipes, resulting in an unpalatable product for the consumer. To overcome this, the practice has been to dip the fish in water at 38° F., covering them with a layer of ice, to conserve the moisture of the fish. This layer of glaze is very readily cracked or broken in handling, thus offering small protection. To remedy this, a glaze has been produced at the Canadian Fisheries Experimental Station, Prince Rupert, B. C. (*Can. Chem. and Met.*, Jan., 1935) from a eutectic ice of water and boric acid. This glaze does not crack easily, and a chip may be broken out of it without injuring the surrounding surface. Very little of the acid penetrates into the fish. The acid also serves to keep down the bacteria which cause reddening of the fish, and the method is proving very satisfactory.

Sulfur Colors for Leather Dyeing

The use of sulfur colors for dyeing chrome and glace leathers has been successfully carried on in Germany. *The Chemical Trade Journal* (London) outlines the method as follows: the product is first neutralized by means of borax or sodium bicarbonate. Then it is immersed in a dyebath containing, on the weight of the treated leather, 500 gms. water, 5% color, 7.5% sodium sulfide, and 50 grammes per litre of Glauber's salt. Dyeing is effected for one hour at 40° C., after which the leather is exposed to the air for fifteen minutes. It is then rinsed and the color fixed by oxidation in an acid bichromate bath. After neutralization by the addition of bicarbonate, the finishing process is effected on the usual lines. It is claimed that the leather is not affected physically by this treatment, and the colors obtained are very fast to light.

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In new fields, too, manufacturers are constantly discovering the unique possibilities of Standard Silicate as an adhesive . . . builder . . . deflocculent and detergent . . . sizing and protective coating, etc. Investigate the versatile properties of Silicate of Soda with relation to YOUR products and problems. Our Technical Department is equipped to give you capable assistance in developing the right grade of Standard Silicate for your conditions.

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MARSEILLES, ILL. — CINCINNATI, OHIO

Booklets and Catalogs

Chemicals

A42. "Products Used In The Textile Industry." The American Cyanamid & Chemical Corp., 30 Rockefeller Center, N. Y. City. A new folder contains, in addition to a list of the chemicals manufactured and sold by this corporation to the textile industry, a partial list of the specialty products which they manufacture for the textile industry's use. Sulfonated oils, penetrants, softeners, sizing compounds and others are included with a brief description of each one.

A43. "Alcohol Talks." Commercial Solvents Corp., 230 Park ave., N. Y. City. The March number of this most instructive monthly is devoted to "Gums, Resins, and Shellac."

A44. "Chemicals." The Grasselli Chemical Co., Cleveland, Ohio. Once again a revised list of chemicals handled by this important factor is issued and every buyer of chemicals will do well to have this handy booklet at hand for ready reference.

A45. "Chemicals In Commerce." Reprints of Williams Haynes' article appearing in the March issue of the *Journal of Chemical Education* are available through this Department.

A46. "The Hercules Mixer." Hercules Powder Co., Wilmington, Del. The March issue of this outstanding house organ in the industrial chemical field features the story of Paper Maker Chemicals' Easton quarters and plants.

A47. "Holyoke—A City of Diversified Industries." Holyoke Water Power Co., Holyoke, Mass. A brochure describes the industrial advantages of Holyoke as an industrial center. Booklet will be most enlightening to industries which may be seeking new manufacturing location.

A48. J. B. Ford Co., Wyandotte, Mich. The booklet is in its tenth edition. It has been enlarged both in size and contents and becomes a most desirable addition to the library of any dyer or finisher. Part 1 is devoted exclusively to the use of alkali in the processing of wool from fibre to finished woven or knit fabric. There is a division showing how and where alkalies can be properly used in connection with rayons. Part 2 is devoted to the uses of alkali in silk processing, and wherever they are consumed in the silk trade ample and accurate information of a thoroughly practical nature is given. Part 3 covers its use in cotton manufacture so thoroughly that it is doubtful if as much useful information about textile alkali has ever appeared anywhere else. Part 4 contains miscellaneous information that every practical man in the mill will find of every day interest and value. Under textile suggestions are a number of valuable formulas including simple tests to determine types of rayons. The inclusion of many rules for textile calculations is a distinct innovation.

A49. Magnus, Mabee & Reynard, 32 Cliff st., N. Y. City. March-April catalog of prices of essential oils, perfume materials, etc., is made a great deal more attractive by the business philosophy of William Feather. This Department recommends perusal.

A50. Mallinckrodt Chemical Works, St. Louis. The March price list.

A51. "Sulfur in Agriculture." The National Sulfur Co., 420 Lexington ave., N. Y. City. A detailed description of the various brands for different agricultural purposes.

A52. "Sulfur in Industry." The National Sulfur Co. A companion booklet to the above, this one listing some of the many usees of sulfur and the specific grades generally required.

A53. "Wettable Sulphur." The National Sulfur Co. Still another in this group. Describes economical pest and fungus control.

A54. "Sulfur Spraying and Dusting Chart." The National Sulfur Co. This is just about the most compact, yet thoroughly complete, chart for flowers, vegetables and fruit trees that has come to the desk of this Department.

A55. "Esso Oil-Ways." Esso, Inc., N. Y. City. This most entertaining and instructive monthly dealing with lubrication problems in industry; contains an intensely interesting article about fertilizers. Details are given on the materials and processes employed by a large Baltimore manufacturer. All plant managers will find this magazine worthwhile.

A56. "Solvay Liquid Chlorine." Solvay Sales Corp., 40 Rector st., N. Y. City. A 40-page booklet, profusely illustrated giving the history, properties, uses and handling of chlorine. An outstanding contribution to the literature and a book that every user of chlorine will find most valuable.

A57. "Reilly Coal Tar Products." Reilly Tar & Chemical Corp., Merchants Bank Bldg., Indianapolis. A most interesting booklet listing the wide number of coal tar products produced by this company. A very remarkable chart is included showing the various materials derived by the distillation of coal tar.

Equipment

A58. "Aluminum News-Letter." Aluminum Co. of America, Pittsburgh, Pa. A newsy monthly brings together all of the new uses for aluminum for the technically minded.

A59. American Flange Co., 26 Broadway, N. Y. City. A detailed description of the new metallic insulating material known as "Ferro-Therm." A number of entirely new engineering principles are involved.

A60. Binks Manufacturing Co., 3114 Carroll ave., Chicago. A new edition of Bulletin AD-114, gives prices and descriptions of new additions to the Binks line of Spray Equipment. New developments described include the Thor Model 5 Touch-up Gun with adjustable spray head and overhead trigger and the Thor Model 6 Touch-up and general utility Gun. Also included is the No. 5 Complete Touch-up Outfit with 6 extra cups, necessary hose and connections and handy metal tray. Bulletin AD-114 briefly outlines the entire Binks line including descriptions, prices and illustrations of spray guns for finishing, cleaning and oiling; cup-type containers, pressure containers, oil and water extractors, hose, air regulators, nozzles, compressors, portable spray outfits, spray booths and exhaust units. Helpful suggestions and technical information on the proper equipment for various users are suggested.

A61. Coppus Engineering Corp., Worcester, Mass. Air filters whose efficiency of 99.9% on 10 micron size dust is based on the dust count method are described in 2 new bulletins recently published. One bulletin—No. F-320-3—describes the Coppus unit type filter for motor and generator intakes, and general commercial and industrial ventilation. The other—No. F-310-2—contains complete data on filters for air compressors, internal combustion engines, etc. Sizes, shapes, and capacities of filters are given in tabular form in this bulletin. Coincident with the issuing of these two bulletins, the Coppus Engineering Corporation announces that it has cancelled the license agreement with Mr. Annis under which it has been manufacturing air filters for the past three years. On Feb. 1, Coppus Engineering began manufacturing and selling unit filters, dry type automatic self-cleaning filters, and filters for compressors and internal combustion engines under the name of Coppus Air Filters.

A62. The Brown Instrument Co., Philadelphia. A new folder illustrates and briefly describes the advantages of using Brown instruments for reducing costs in boiler room and plant processes.

A63. "The Laboratory." The Fisher Scientific Co., 717 Forbes st., Pittsburgh, Pa. This valuable monthly describes the latest innovations in laboratory supplies and at least one copy should be received regularly in every laboratory. This Department will be glad to arrange for readers to receive it.

A64. Foster Pump Works, 50 Washington st., Brooklyn. Engineering data, specifications, etc., on the complete line of "Excelsior" rotary pumps.

A65. "Remove the Menace of Dust." U. S. Hoffman Machinery Corp., 105 4th ave., N. Y. City. A splendidly illustrated brochure on the scientific methods of plant cleaning.

A66. J. B. Sedbury, Inc., Utica, N. Y. A new leaflet describes the "Jay Bee" crusher, grinder, pulverizer, designed for grinding tankage, bone, blood meal, crackling, fish scrap in one continuous operation without the use of cage mills, elevators or screens.

A67. Link-Belt Co., 910 S. Michigan ave., Chicago. A 32-page book, No. 1425 presents data on modern high speed chain drives.

A68. Littleford Co., Cincinnati. A generously illustrated folder shows many examples of steel fabrication done by this company for chemical and chemical process industries.

A69. Parker Appliance Co., Cleveland. Bulletin No. 38 gives complete data on Parker values.

A70. C. J. Tagliabue Mfg. Co., Park & Nostrand aves., Brooklyn. New folder discusses exclusive features of "Tag" pyrometers.

A71. "Worthington Diesel Engines." Worthington Pump & Machinery Corp., Harrison, N. J. Our readers who are interested in Diesel engines will find considerable material of value in a 16-page booklet, designated as Bulletin S-500-B6D. Aside from specific information on the merits of Worthington engines, ranging in size from 25 to 1000 horsepower and from one to 8 cylinders, this bulletin contains much data of general interest on the subjects of Diesel construction and the application of this type of prime mover to a wide range of services and industries. One feature worthy of special mention is a sectional view of a typical engine, showing clearly the various essential details and features, supported by explanatory notes.

A72. "Worthington Monobloc Centrifugal Pumps." Describes what the manufacturer calls the ideal standard for the special needs of the small pump user.

A73. "Worthington Monobloc Centrifugal Pumps, Types DE, DF, DG." Worthington has just added 2 larger units to its Monobloc centrifugal pump group. A few of the many different fields in which Monoblocs have established themselves by their convenience and performance, are: air conditioning, water heaters, refrigeration, laundries, boiler return systems, breweries, chemical processes, industrial plants, etc. Booklet describes and illustrates and in addition, includes complete data and rating tables.

Containers, Packaging Equipment

A74. American Can Co., 230 Park ave., N. Y. City. After months and months of research American Can announces the perfecting of the lacqured "Keglined" beer can.

A75. "Packomatic." J. L. Ferguson Co., Joliet, Ill., tells the story of latest automatic packaging installations made, many of them in the chemical and chemical specialty fields.

A76. Anchor Cap & Closure Corp., Long Island City. New leaflet shows designs of molded caps.

Received Late for Classification

A77. "Master Drums and Pails." The Master Package Corp., Owen, Wisc. A 6-page circular describes and gives technical data on sizes, strength, etc., on the complete line of fibre drums manufactured by this company, and introduces the Master Tapered Fibre Drum and the Master Fibre Pail with the snap-on, self-locking cover. The pail is also tapered in shape. All those charged with packaging problems should investigate this line, particularly the last mentioned items. The advantages of the tapered feature is explained. It permits, among other things, to nest empty drums, in fact, 10 drums can be stacked in the space of 2. Their general characteristics make them especially adaptable to packaging dry chemicals.

A78. "Patterson Mixers." The Patterson Foundry & Machine Co., East Liverpool, Ohio. A very attractive new booklet gives complete data on the several styles and variations as well as the outstanding engineering advantages of the well-known Patterson line of mixers. There is a style for practically every purpose that can be thought of in the chemical and allied processing fields.

A79. "The Vanderbilt News." R. T. Vanderbilt Co., 230 Park ave., N. Y. City. The March-April issue contains among other highly interesting articles the story of the developments under way in Malaya towards solving the problem of cost, and the difficulties encountered in using liquid latex for road compounds that can be poured like concrete. For the technical rubber chemist there are the usual number of outstanding articles for which this paper is famous. Only a limited number of copies of this magazine are printed and the supply is therefore, strictly limited.

Chemical Industries,
New York City.
25 Spruce Street,
I would like to receive the following booklets; specify by number: ....
....
Name ....
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Company ....
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Plant Operation and Control

A Digest of the Current Literature for Makers of Chemicals

New White Lead Manufacturing Methods

By M. Schofield

Although new uses and the total production of basic lead carbonate have not been increased to any extraordinary degree, yet more efficient methods, if efficiency be measured by saving in time, are constantly appearing. The recognition of the substance as a definite compound rather than a mixture of lead carbonate and hydrated oxide has stimulated the study of possible methods for producing it in shorter periods than the 120 days required by the Dutch or "Stack" process.

The Dutch process is now carried out in corroding houses in which the layers of pots are placed over layers of tanbark, the latter replacing the use of dung; the corroding house usually takes from eight to ten tiers of pots. By fermentation of the spent tanbark temperatures up to 180° F. are often attained, and while thermophylic bacteria were solely the cause of this liberation of heat in the dung processes, it is not definitely established that specific bacteria alone in tanbark can yield so high a temperature. All modern Dutch methods require a high-grade form of lead pig, for any impurities originally present are not eliminated as is the case in other methods of conversion. Silver, bismuth and copper should be removed until a value below one-hundredth of one % is attained. Acetic acid solutions are usually of 2 to 3% strength, and although some of this raw material is lost as basic acetate remaining in the white lead, yet the presence of this does not detract from the value of the product.

A number of modern processes are modifications of Thénard's method, which consisted in preparing basic lead acetate and passing carbon dioxide into the solution. The first modification of importance is Matheson's process, in which white lead was precipitated by use of carbon dioxide, the neutral lead acetate thereby formed being now re-boiled with a suspension of litharge to form the basic acetate which is returned to the process. This process appears to have been suspended, but attention to Thénard's scheme is raised by the appearance of certain patents within recent years. One of these stipulates the use of a mixture of litharge and acetic acid which is sprayed through a current of CO_2; a second patent describes the whipping into an atmospheric suspension of a similar mixture within a revolving closed container through which both air and CO_2 circulate at a definite rate. A further modification, which has been brought to commercial success, covers the production of a basic carbonate by Thénard's method, the product containing equimolecular proportions of $Pb(OH)_2$ and $PbCO_3$. This is now mixed with the correct proportion of the normal carbonate, the latter being obtained by continuation of Thénard's precipitation with CO_2 until the suspension is converted to $PbCO_3$ almost completely. The product is equal in opacity and properties to that of the Dutch process.

Further advances were attained when the use of comminuted or atomized lead was tried out, the idea being to accomplish in a fortnight the conversion normally requiring 18 weeks exposure in the stack. U. S. Pat. 1,655,723 recommends the use of a rotating cylinder containing powdered lead and quartz pebbles, an atmosphere of CO_2, steam and air being blown in. In processes adopted in practice, less than two tons of finely divided lead constitutes a batch, this amount being fed into wood-lined rotary cylinders. The lead is now treated with carbon dioxide and acetic acid, a dilute form of the latter being sprayed in for replacing losses. Rotation of the cylinders carries the dispersed lead upwards and exposes fresh surface for corrosion, the process being sufficiently exothermic for dispensing with external heat supplies.

Introduction of Electrolytic Methods

As in many other chemical industries, electrolytic methods have entered the field in white lead manufacture. Fifty years ago Roth and Sylvester suggested a process in which acetic acid formed at a lead anode yields lead acetate, which is now caused to react with sodium hydroxide formed at the cathode, white lead being formed on the admission of carbon dioxide. The Sperry process (Ger. Pat. 391,692) has now been adopted on a commercial scale. In this case a solution of sodium acetate is electrolyzed between anodes of lead and cathodes of iron or copper, CO_2 being passed in round the latter poles, and a diaphragm being utilized to surround the cathode. The sodium hydroxide is partially carbonated and diffuses through the porous diaphragm into the anode liquor of lead acetate, the latter being formed by discharge of the acetate ions at the lead pole. The final product contains excess normal lead carbonate according to one authority, but the particles are very fine and white and the continuity of the process is another asset. From the anode liquid there settles a thick mud of white lead, which is filtered through a press, washed, dried and ground in the usual way. Among alternative schemes for electrolytic production is the use of sodium chlorate as a catalyst in the solution charged with carbon dioxide (Eng. Pat. 298,520), the lead product being allowed to settle in the electrolytic cell itself. As an alternative oxidizing agent sodium nitrate has been suggested, a solution of this together with an addition of a water-dispersible colloid being used (in the method given in Eng. Pat. 380,457, for example) as electrolyte. Lead electrodes, a current density of 20 amps. per sq. ft., and withdrawal of electrolyte for partial carbonation are further conditions advocated.

Recent studies of the formation of white lead under various conditions have been made by A. Sauer and M. Zipfel. By the action of CO_2 on basic acetate of lead it has been shown that the product is definitely $2PbCO_3 \cdot Pb(OH)_2$, that the best result is attained by avoiding excess of carbon dioxide, and that a high temperature is more favorable to the desired reaction. It is also advisable to maintain a definite pH control in the solution and, in order to obtain a highly dispersed product, to use a colloid as indicated above. While secondary aggregates are liable to be formed, yet the degree of dispersion of the bulk of the product appears to depend more on the conditions, a high dispersion not necessarily being confined to the Dutch method. Other workers have acquired patent rights for use of sodium

carbonate, sodium hydroxide and CO_2, and sodium bicarbonate for introducing the basic carbonate radicles under various stipulated conditions; some of these start with lead chloride, or with waste plumbiferous material treated with sodium chloride, others use litharge dispersed in dilute acetic acid, or in nitric acid or ammonium nitrate solution. J. F. Sacher has studied the action of ammonia and carbon dioxide passed into a pulp of litharge prepared in a pressure vessel, whereby a quantitative conversion is claimed, excess gases being recovered and returned to the system. A. I. Kogan has shown that the opacity of white lead falls with the formation of excess carbonate of lead above the equational amount.

As a final point, mention should be made of a method of eliminating poisonous soluble constituents from the product of the Dutch method. It is recommended (Eng. Pat. 315,637) that a continuous stream of sodium bicarbonate solution should be passed into the pots or tanks, any lead acetate being thereby converted completely to carbonate. The product is then washed in the filter press until free from sodium acetate.—*The Chemical Age, British*, Mar. 9, p. 218.

The Laboratory

Necessity for Correct Laboratory Furniture

The persons to whom these remarks are particularly directed are those chemists in industry who, for one reason or another, go through their lives working under the most miserable laboratory conditions that could be devised, without a whimper. Those who do not, may stop at this point. You can find them stuffed away in holes and corners, or occupying some inadequate or unsuitable ledge. If they are not to be found in the cellar, you look for them on the roof. And, when found, the inhabitants of these laboratories seem to possess, as a class, about the most brow-beaten appearance to be found around the organization. These conditions can continue long years after the necessity for a laboratory has been demonstrated. And when they do, the fault lies largely with the chemists. In a number of cases, conditions would be rectified by a simple, business-like demand from the chief chemist for enough money to fit himself out properly. The design and construction of good laboratory furniture or equipment is beyond the experience or capacity of most chemists; and knowing this, they should do what they can to keep it out of the hands of even more incompetent persons.

The fact that many laboratories were attached to industry by a form of selling which promised the saving of much money, has presented difficulties in the course of time. The idea was thus created that, unless a laboratory continues to save vast sums that might otherwise be going down the drain, it should be abolished. Now, there is no other part of any business operating under such a handicap. A sales department does not tell the management it is going to save. In fact, it fairly definitely sets out to spend and to sell. And there is nobody doing much conscious saving in the factory, because they are too busy with production.

Many Laboratories Victims of Fake Economy

And so the chemist and the laboratory must, it appears, continue to look poor, simply to indicate that this organ of the business is devoted in some special and amazing manner solely to the purpose of saving the company money. That must explain much that passes for laboratory furniture, laboratory ventilating systems, laboratory plumbing, and laboratory location. The laboratory should be just one of the "idea" factories of the company. The products including certain facts, plans, and suggestions it sells or pools with the other idea units of the business. There is nothing written in the bond to say that one group is more important than the other and must have more and better working conveniences.

It would pay quite a number of professional chemists, and would be a good thing for chemistry and industry, if the word "control" were substituted for "saving," and the word "office" for "laboratory." If chemists maintained offices in industry, they would soon have better furniture. The idea of "development work"—not to mention "research"—will always command better equipment than the words "control" and "saving." And, after all, where is the economist who would dare to dispute that goods produced for laboratory decoration or consumption are not just as much a part of industry as products sold for any other purpose? Such production and consumption will create just as much real wealth as anything else; so let us have more of it.—*Canadian Chemistry & Metallurgy*, February, p. 33.

Plant Equipment

Choice of Woods for Chemical Vats

Reasons behind the choice of woods for chemical vats were discussed in a paper delivered recently before the British Chemical Engineering Group of the Society of Chemical Industry by W. G. Campbell, and reported in the British *Chemical Trade Journal*, Dec. 21, p. 447.

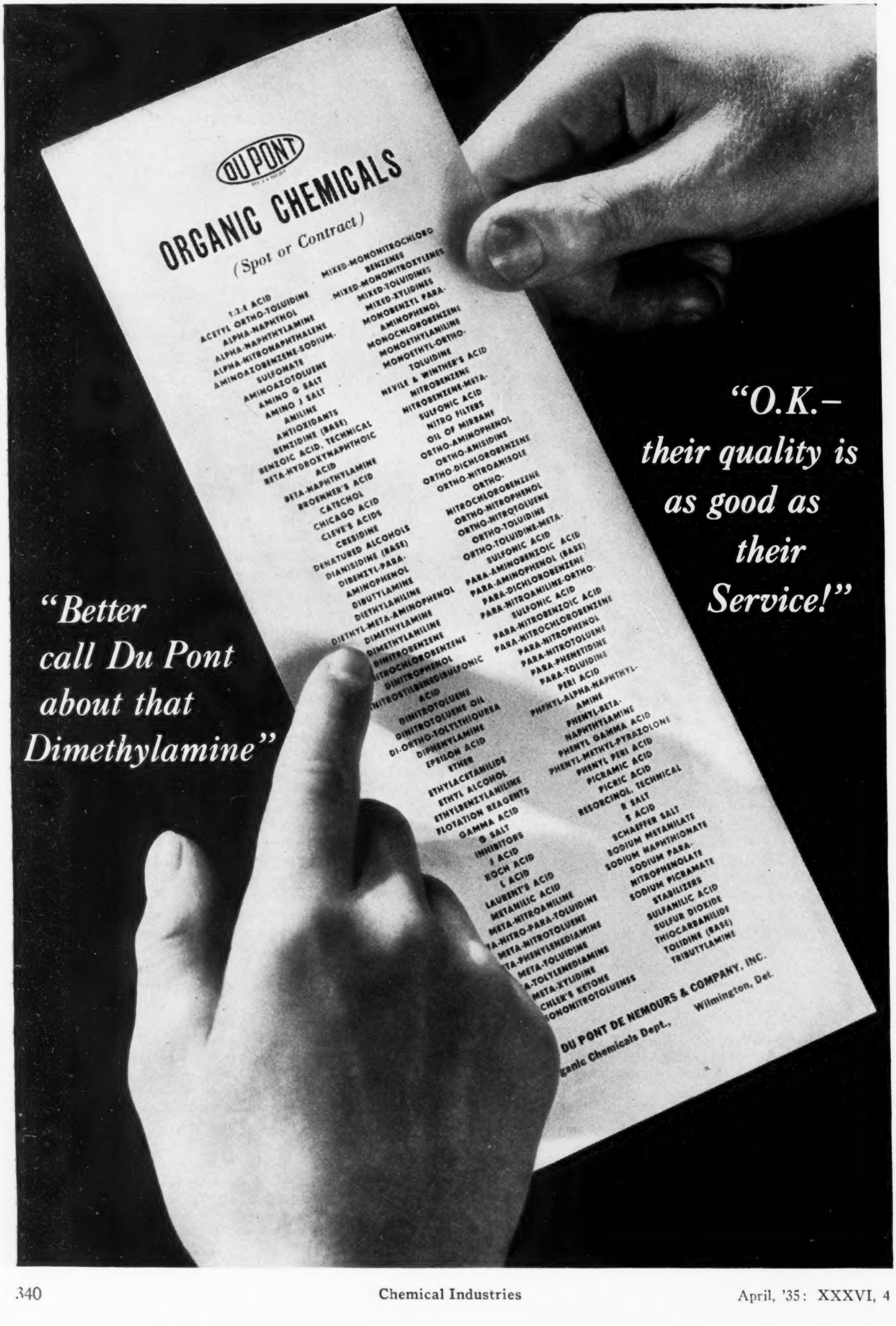
In England chemical engineers lean to pitch pine with Douglas fir as a close second. In the U. S., Louisiana gulf cypress holds first choice. Teak and New Zealand kauri pine are also excellent.

Leaving aside such important questions as price availability in the proper sizes and working qualities, it is generally admitted that anatomical structure is important, as upon this the important factor of permeability is mainly dependent. Again, it has been claimed that certain minor constituents, like the resin in pitch pine, exert a protective effect on the fibres, for example, against acids. This probably is an important factor, but it can be over-stressed. Experience has shown that pitch pine, which contains too much resin, does not make a good vat for use with hot liquids, since under the influence of heat the resin may ooze out of the wood with a resultant high degree of shrinkage.

There is another factor in the case which has come to light in the course of recent research, and this is the composition of the wood cell wall itself. Probably no wood will be found to give long service in contact with caustic alkalis, for the fundamental reason that these reagents attack all of the major components as well as some minor constituents. To use caustic soda in a vat which has previously been used for acids is not to be recommended either, since it has been shown experimentally that even mild preliminary acid hydrolysis renders wood substance much more soluble in alkali than it would otherwise be. In general, softwoods, on account of their relatively low hemicellulose content, withstand alkalis better than hardwoods.

The pronounced oxidizing effect of concentrated nitric acid on wood is well known, but even in low concentrations this acid has also a pernicious effect, since it causes both oxidation and hydrolysis, resulting in the simultaneous breakdown of all the major wood components.

The main value of woods in chemical plant construction lies in its resistance to acid liquors such as sulfuric and hydrochloric acids and their acid salts. This is directly attributable to the fact that the lignin and α-cellulose of wood are very resistant to acids. Other things being equal, woods which have a high α-cellulose content, a high lignin content, and a low pentosan content, will offer the best resistance to acids. Hardwoods as a rule have much higher pentosan contents than softwoods, but teak is an exception. Teak is also favored with high lignin and cellulose contents, so that when due allowance is made for the strength, structural characteristics, and the protective effect, if any, of minor constituents, the reliability of teak for certain purposes finds a more complete explanation than has hitherto been available.


DU PONT
ORGANIC CHEMICALS
(Spot or Contract)
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ALPHA-NAPHTHOL
ALPHA-NAPHTHYLAMINE
ALPHA-NITRONAPHTHALENE
AMINOAZOBENZENE-SODIUM-SULFONATE
AMINOAZOTOLUENE
AMINO G SALT
AMINO J SALT
ANILINE
ANTIOXIDANTS
BENZIDINE (BASE)
BENZOIC ACID, TECHNICAL
BETA-HYDROXYNAPHTHOIC ACID
BETA-NAPHTHYLAMINE
BROENNER'S ACID
CATECHOL
CHICAGO ACID
CLEVE'S ACIDS
CRESIDINE
DENATURED ALCOHOLS
DIANISIDINE (BASE)
DIBENZYL-PARA-AMINOPHENOL
DIBUTYLAMINE
DIETHYLANILINE
DIETHYL-META-AMINOPHENOL
DIMETHYLAMINE
DIMETHYLANILINE
DINITROBENZENE
DINITROPHENOL
ACID
DINITROTOLUENE
DINITROTOLUENE OIL
DI-ORTHO-TOLYLTHIOUREA
DIPHENYLAMINE
EPSILON ACID
ETHER
ETHYLACETANILIDE
ETHYL ALCOHOL
ETHYLBENZYLANILINE
FLOTATION REAGENTS
GAMMA ACID
G SALT
INHIBITORS
J ACID
KOCH ACID
L ACID
LAURENT'S ACID
METANILIC ACID
META-NITROANILINE
META-NITROTOLUENE
META-TOLUIDINE
META-XYLIDINE
MIXED-MONONITROCHLORO BENZENES
MIXED-MONONITROXYLENES
MIXED-TOLUIDINES
MIXED-XYLIDINES
MONOBENZYL PARA-AMINOPHENOL
MONOCHLOROBENZENE
MONOETHYLANILINE
MONOETHYL-ORTHO-TOLUIDINE
NEVILE & WINTHER'S ACID
NITROBENZENE
NITROBENZENE-META-SULFONIC ACID
NITRO FILTERS
OIL OF MIRBANE
ORTHO-AMINOPHENOL
ORTHO-ANISIDINE
ORTHO-DICHLOROBENZENE
ORTHO-NITROANISOLE
ORTHO-NITROCHLOROBENZENE
ORTHO-NITROPHENOL
ORTHO-NITROTOLUENE
ORTHO-TOLUIDINE
ORTHO-TOLUIDINE-META-SULFONIC ACID
PARA-AMINOBENZOIC ACID
PARA-AMINOPHENOL (BASE)
PARA-DICHLOROBENZENE
PARA-NITROANILINE-ORTHO-SULFONIC ACID
PARA-NITROBENZOIC ACID
PARA-NITROCHLOROBENZENE
PARA-NITROPHENOL
PARA-NITROTOLUENE
PARA-PHENETIDINE
PARA-TOLUIDINE
PERI ACID
PHENYL-ALPHA-NAPHTHYL-AMINE
PHENYL-BETA-NAPHTHYLAMINE
PHENYL GAMMA ACID
PHENYL-METHYL-PYRAZOLONE
PHENYL PERI ACID
PICRAMIC ACID
PICRIC ACID
RESORCINOL, TECHNICAL
R SALT
S ACID
SCHAEFFER SALT
SODIUM METANILATE
SODIUM NAPHTHIONATE
SODIUM PARA-NITROPHENOLATE
SODIUM PICRAMATE
STABILIZERS
SULFANILIC ACID
SULFUR DIOXIDE
THIOCARBANILIDE
TOLIDINE (BASE)
TRIBUTYLAMINE
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Wilmington, Del.
"Better call Du Pont about that Dimethylamine"
"O.K.– their quality is as good as their Service!"

This aspect of the study of acid resistance has been applied to other woods, and the results, will be published in due course. For the present the position might be summed up by saying that it is more than ordinarily unusual to find a wood that is imbued with all of the advantageous characteristics of the examples cited, and that is why it is difficult to find substitutes for those few species which long experience has shown to be the best woods to use in chemical plants.

Plant Maintenance

Cleaning Paint Mixing Equipment

Paint companies in the Toronto area were asked:

1. What plant equipment is cleaned with solvents?
2. What types of solvent are used?
3. How much solvent is used in a year for cleaning plant equipment?
4. What other cleaning methods are used?
5. Is a lye vat operated and what equipment is cleaned in it?

All firms use both solvent and alkali cleaners for cleaning plant equipment. In some cases, the solvent method, and in others the akali, is used for most of the cleaning; but the well-known economy of the alkali system would indicate that it should be applied wherever practical. Firms that have operated for a time on solvents alone always notice a big drop in cleaning costs when an alkali unit is installed. Solvent vapor cleaning systems are not in use, although this method is applied to cleaning smaller apparatus and might be practical for larger equipment.

The wide difference of opinion as to types of equipment that can be handled without damage in a tank is reflected in the variation in approximate figures for solvent consumption from 5,000 to 400 gals. per year. At least two firms wash practically all portable equipment in an alkali cleaner varying in composition from straight caustic to a mixture of caustic and soda ash. These alkali cleaning mixtures are used cold or heated by steam jackets or live steam. Some firms follow the alkali cleaning operation with a water rinse and a wipe out with a thinner containing a high percentage of alcohol. Others simply rinse well with water and allow to dry.

Washing Buhrstone mills in alkali has been found quite practical. Considerable savings in time are effected, the mill is readily prepared for dressing and no damage is done to the mills over a period of one and one-half years.

Approximate figures for thinner consumption in cleaning indicate that more of this solvent is used than is realized, but the places where it was used, in cleaning fixed mechanical agitators, centrifuges, laboratory equipment and glass and wooden panels, did not offer any choice.

Common practice in cleaning varnish kettles was not investigated. One firm is experimenting with an air-turbine driven wire brush which is very effective for removing the hard ring of oxidized material that forms around the edge of the kettle at the liquid level.

Special Thinner Used Occasionally

Benzine, mineral spirits or kerosene are used to clean off undried paint, while for dried paints or lacquers stronger solvents are needed. Some firms use a special cheap thinner formulated for the purpose, others their cheapest commercial thinner; and a third group believe it economical to use undiluted strong ester solvents, such as ethyl acetate. At least one firm uses mechanical methods to partially clean paint equipment such as containers and mixers. Dried paint is chipped off as well as possible with chisels.

Solvent Recovery

Recovery of solvents by distillation has been given consideration, but its economy is doubtful in view of the small volume used. In the U. S., there are companies which collect dirty solvent, subject it to distillation and return the purified solvent at a charge per gallon.

Present practice in the recovery of thinners varies greatly. Some firms use the thinner in the batch of material being made with due allowances in formulation. Thinners that are used for cleaning off dried paints are commonly used over and over until no longer efficient. In some cases, this type of dirty solvent is stored in tanks provided with a draw-off some distance above the bottom layer of sludge. The top layer of comparatively clean thinner, although contaminated with soluble material, is mixed with clean thinner for further cleaning operations or used in third-grade dark colored products. One firm has found a market for dirty thinner and drums its accumulation. The sludge from the thinner settling tanks is removed at regular intervals.—Paper delivered before the Toronto Paint & Varnish Production Club, by Jeff Brock, Canadian Industries, Ltd.

Economy of Dust Collecting

Factory Management & Maintenance points out that the cost of a suitable dust collecting system is never high if it is first properly engineered; second, considered in the light of the benefits to be derived. These benefits are manifold, but cannot always be expressed in dollars and cents. They may consist of one or more or all of the following:

1. Reduction in accident hazards.
2. Reduced labor turnover.
3. Greater efficiency of employees resulting in reduced production costs.
4. Reduction in wear and tear on machinery, particularly when dusts of an abrasive nature are involved.
5. The saving of large quantities of a product when the dust collected is the finest part of the product and has in many instances the greatest value.
6. Reduction in labor by the elimination of sweeping and cleaning.
7. Elimination of danger to health of employees.
8. Elimination of a nuisance to the industrial establishment itself as well as to its neighbors.
9. The aesthetic value of a clean plant.
10. Prima facie evidence that the employer is using every reasonable measure to protect the health of his workers, therefore providing a defense against the legal depravations of the dust racketeer or ambulance-chasing lawyer.

Preserving Specific Equipment

W. S. Joule suggests in his column "Power" (*The Paper Industry*) that to prevent internal corrosion in idle boilers these should be emptied and dried, trays of unslaked lime should be placed inside, and all manholes and other openings should be hermetically sealed. The lime will soon absorb any moisture, carbonic or sulfurous acid that may be in the boiler, and any remaining salt or chloride of magnesia, being dry, can do no harm.

Protecting Wire Rope

To preserve wire rope, apply raw linseed oil with a piece of sheepskin, wool inside; or mix the oil with equal parts of Spanish Brown and lampblack. To preserve wire rope under ground or in water, take mineral or vegetable tar, add 1 bu. of fresh slaked lime to 1 bbl. of tar, which will neutralize the acid; boil it well, then saturate the rope with the boiling tar.

Plant Operation

German Hydrogenation of Anthracite

The *Chemische Fabrik* (Feb. 6th issue) contains the report of the operation of the large scale experimental plant of the I. G. for the direct hydrogenation of anthracite.

Raw material with 2 to 5% ash content is roughly broken up before grinding to a paste with heavy oil (a product of the hydrogenation process itself). At the same time the catalyst, also ground in oil, is incorporated. The resulting paste, containing 50 to 60% of anthracite, can easily be pumped in the warm state. Under 300 atmospheres pressure it is forced into a pre-heater where, in admixture with the hydrogen, it is brought to a temperature of 410° C. before entering the first of a series of reaction chambers arranged one behind the other

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This part of the plant is located in a concrete housing. Each furnace is about 12 meters in length and provides a reaction space of about 3 cu. meters. In the first furnace the temperature rises rapidly to 460° C. and medium-heavy oil, benzine and minor quantities of gaseous hydrocarbons are formed. Additional quantities of catalyst, suspended in oil, are sprayed into the reacting mass. Excessive rise in temperature is prevented by introducing cold oil, coal paste or gas at the over-heated localities. The reaction is completed in a second chamber when the products are passed on to a separator maintained only a little below the hydrogenation temperature. From here the heaviest liquid oils are run off as sludge in admixture with the suspended ash and coal residues. Vapors of the lower boiling oils and the gaseous products were led off from the upper part of the separator. The liquid level in the separator was kept constant to ensure sharp separation of the liquid and gaseous products.

The hot vapors emerging from the separator enter the heat exchanger where they serve to heat up the raw materials on their way to the reaction furnaces. Separation of the liquid and gaseous products follows in a cooling apparatus and is effected with great ease under the high working pressure.

The liquid products separated in this part of the apparatus represent about 70% of the total oil and contain the whole of the newly-formed oil. After releasing the pressure and eliminating water, the liquid is distilled to give 3 main fractions: benzine coming over up to 170° C., a medium oil boiling up to about 325° C., and, finally, a heavy oil. The latter is used as a grinding medium for a fresh batch of coal.

About 1,500 tons of coal were put through the plant without mishap during continuous working for three months, at the end of which time the apparatus was in perfect working order. About 20 to 21 tons of coal were treated daily under the optimum conditions and yielded 13 to 14 tons of oil.

Experience gained with this plant indicates that the cost of benzine by hydrogenation of anthracite should not be higher than that obtained by lignite hydrogenation. Motor spirit obtained by this process possesses satisfactory anti-knock qualities. It has an octane number of 66 to 68, which can be increased to 73 to 76 by the addition of 10% alcohol.

Maintenance of Grinding Mills

Grinding mills should first of all be specially selected to suit the actual material to be treated. In many cases grinding equipment is favored from the initial expenditure without any investigation as to how much replacements will cost per ton of material ground. It is also very important to note that the proper choice of modern grinding equipment allows the pulverizing department to be kept as clean and dustless as any other part of the plant. Dustless operation is economical operation; maintaining a clear atmosphere in the grinding room not only will eliminate much wear and tear from auxiliary equipment, such as belts, bearings and motors, but at the same time will decrease accidents and in general be conducive to health.

Wear and tear on grinding equipment can be governed quite definitely by operation; for instance, supposing we have chosen the correct machine for the material handled it is equally important to watch that conditions of feed remain a constant. It is easy to visualize, in many types of medium-speed mills, such as ring and roll, that if the mill is allowed to run practically empty the rolls running on the grinding ring will set up unnecessary wear. In the case of ball mills, which are a comparatively slow-speed type, the same thing applies, and an empty mill will allow the balls to grind themselves away because there is nothing to cushion against. This does not apply to the general type of high-speed pulverizer as far as running the machine empty, but, on the other hand, it is well known that high-speed beater, pin, or hammer mills wear out much quicker on a number of materials solely due to the method of grinding, especially on a fairly hard or semi-abrasive material.

The various types of mills can be classified as follows:—

Material	*Type of Mill*	*Speed*
1. Hard and abrasive	Ball mills	Slow speed
2. Semi-abrasive and medium hardness	Ring roll	Medium speed
3. Soft grades of chemicals, etc.	High speed (Beater, pin or swing hammer)	High speed

From this classification we can readily see that for continuity of operation on siliceous materials lowest maintenance costs are obtained on the ball mill. Abrasives can be treated on this type if mill and the grinding media can be introduced while the mill is running. This is a very important factor, because when grinding media are replaced many types of mills have to be stopped; this means loss of production time and the addition of labor charges must be taken into account for making the replacement.—*Chemical Age*, British, Feb. 16, p. 145.

Distillation Methods Discussed

Relative merits of continuous and discontinuous distillation are: In the continuous process there is, as a rule, a reduced fuel consumption, the losses through bad manipulation of the liquids are reduced, the wear and tear of the equipment is less, and smaller quantities of material to be distilled are exposed to the heating source and the time of exposure is less. Large volumes may be dealt with in unit time and consequently process labor costs are generally less. The distillates coming from predetermined points on the fractionating column do not vary in quality except within narrow limits, and there are no intermediate fractions of distillate requiring redistillation.

The disadvantages of continuous working included much higher initial cost, and if the continuity of the process is upset much damage may be done before the process can be stopped. Shutting down and starting up is expensive. The fact that distillates produced are of constant quality becomes a disadvantage often, when market requirements change, and the plant is not flexible enough to allow of the new requirement being produced without expensive alterations in design. The fact that there are no intermediate fractions requiring redistillation generally means that the fractionation on the whole is not so clean cut as in the discontinuous operation. While there is fuel saving for heating purposes, the cost of power to keep the liquids in continuous motion must be added. The continuous equipment requires attention from more skilled labor than does the discontinuous plant.—Paper delivered before the Andusonian Chemical Society, England, by R. W. Edie.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Alcohols. "Synthetic Alcohols and Related Products from Petroleum," by Benjamin T. Brooks. Cracked oil gas is the cheapest source of the simple olefins. New data are presented for the yield and composition of gas made by vaporphase cracking at temperatures higher than are employed for maximum gasoline production. *Industrial & Engineering Chemistry*, March, 1935, p278.

Fertilizers. "Oberphos, Its Production and Experimental Uses," by Vincent Sauchelli. A description of the Ober method of manufacturing superphosphate. *The American Fertilizer*, Mar. 9, p5.

Foreign Chemical Trade. "Gains In Chemical Foreign Trade in 1934," by Otto Wilson, *Industrial & Engineering Chemistry*, March, p344.

General. "Chemistry Represents Key Industry of America," an interview of August Merz by Francis A. Adams. *Rayon & Melliand Textile Monthly*, March, p30.

General. "The Near Future of Ramie," by Charles R. Pierce. Improvement of process for producing spinnable fiber another step in developing a ramie textile industry in the south. *The Manufacturers' Record*, March, p28.

General. "Separation of Water from Acetic Acid by Azeotropic Distillation," by Donald F. Othmer. The azeotropic method is demonstrated to have the 3 requirements of a satisfactory process for separating acetic acid from pyroligneous acid: (1) simplicity and minimum number of pieces of equipment and operations, (2) minimum size and therefore low cost of these units, (3) low steam cost. These same advantages are even more apparent when starting with the relatively strong solutions encountered as precipitation liquors from cellulose acetate manufacture. *Industrial & Engineering Chemistry*, March, p250.

General. "The Utility of Carbide Residue." A perfectly amazing number of uses for carbide residue are elaborated upon. *Oxy-Acetylene Tips*, March, p56.

Plant Equipment. "Jacketed Industrial Glass Heat Exchanger," by H. C. Bates. *Industrial & Engineering Chemistry*, March, p273.

Textiles. "Silk Weighting," by Marion Chinn and Ethel L. Phelps *Textile Colorist*, March, p195.

New Equipment

Comparing Colors QC 231

A new Colorimeter, a scientifically designed instrument which accurately matches or compares colors, registering variations indiscernible to the human eye is now on the market. It is stated that with this device it is possible to match shades to a degree far beyond commercial requirements. The instrument is light and compact, completely encased in Bakelite molded. It operates from any 110-volt light socket. Color comparisons are made very simply . . . the instrument is placed over the surface of the standard color, the switch is turned on, and readings are taken. The same process is repeated with the color which is to match the original. The comparison of the readings indicates discrepancies "to the millionth degree." The device is actuated by a photo-electric cell.

Metal Insulating Material QC 232

Surprising as it may seem, commercial black steel is now utilized under a new invention to produce an insulating material unsurpassed in efficiency, it is claimed, by any insulation now known. This metal insulation consists of parellel spaced metallic sheets with dull or non-bright surfaces; the sheets having low emission and high reflection values at the frequencies of radiant heat.

Thin sheets of commercial black steel are used and are formed with angularly arranged surfaces with small ribs at the jointure of these surfaces, thereby securing rigidity, elimination of vibration with prevention of propagation of sound waves and improved insulating qualities.

The number of sheets used in an insulated wall may be one or more, depending upon the temperature difference and the heat conductivity desired. The spacings between the sheets are based on the results of extensive experiments which have determined the arrangement best suited to eliminate turbulent air flow and to provide the highest thermal-insulating value.

Flow Meter with Varying Orifice QC 233

An interesting new type of flow meter, which utilizes a varying orifice, is now being manufactured. As the flow of steam, water, oil, or other liquid or gas varies, the orifice opens and closes. In the past the measurement of flow through a pipe has usually been based on measuring the variation in the pressure drop across a fixed orifice in the line. In this new flow meter a constant pressure drop is maintained by changing the orifice opening. The flow is then accurately determined by measuring the amount of orifice opening at any instant.

It is claimed that the varying orifice principle of operation makes it possible to measure low rates of flow accurately down to as low as 2½% of the meter capacity. It is also said that pulsating flows can be more accurately measured. Errors due to friction are also eliminated, it is claimed, because the power of the actuator is far in excess of that actually required to move the orifice gate and the metering units are electrically driven.

Recording at Distances QC 234

A duplicate position telemeter system for indicating and recording at a distance the position of mechanisms such as bridges, gates, valves or water level in water power plants, engine governor positions, or the position of any important mechanism, is announced.

New Daylight Lamp QC 235

In accordance with new specifications adopted in June, 1934, by the A. S. T. M., one of the well-known makers of precision instruments, offers a new daylight lamp for color determinations which gives, it is said, an illumination more closely approximating ideal daylight conditions for color tests than any lamp designed up to this time.

Fire Extinguisher QC 236

A new 2-quart vaporizing liquid fire extinguisher that is discharged by air pressure and delivers a fan-shaped spray as well as a solid stream has just been announced. This extinguisher is recommended for incipient fires in all classes of material, and especially for flammable liquids and electrical fires.

Industrial Vacuum Cleaning QC 237

An inexpensive combination portable cleaner, for industrial vacuum cleaning, blowing and spraying is now being built. When used as a vacuum cleaner, the accumulations of dirt, dust, scrap, etc. are first drawn into a 12-gal. aluminum finished steel tank, where the heavy dirts, metals, filings, turnings, etc. are deposited and only the very fine dusts and dirt are drawn into the dust-proof bag. This design prevents the heavy materials from passing through the fan and injuring the fan blades. As collections in the metal tank can be easily salvaged, this machine is being used more and more in shops and plants where work in expensive and precious metals is done.

Obtaining Maximum Combustion Efficiency QC 238

A new fuel flow—air flow meter recently developed guides operators of furnaces and kilns so that they are able to obtain maximum combustion efficiency from the fuel burned. The primary purpose is to provide furnace operators with an easy guide so as to secure the highest possible combustion economy. The meter contains 2 recording pens, one records the rate of oil flow or gas flow and is actuated by a simple mechanical mechanism which receives its motive power from the differential pressure produced by an orifice in the fuel line. In a similar manner the second pen records the flow of air supplied for combustion when the meter is installed, a complete combustion test is made to determine the ratio between fuel flow and air flow, which results in best combustion conditions. After this ratio is determined, the air flow mechanism is adjusted so that the 2 records coincide, one upon the other, when best combustion conditions are obtained. The furnace operator therefore, has merely to keep the 2 pens together for proper manipulation of the air supply to secure the desired economy of fuel consumption.

Etching Laboratory Glassware QC 239

A new chemical specialty, packed in a large tube, is said to etch glassware permanently by a simple, quick and inexpensive process. A number of uses in the laboratory will suggest themselves. It is said to be harmless.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

Q C 231	Q C 236
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Name ....

Title ....

Address ....

Packaging, Handling and Shipping

¶ ***Importance of Wooden Barrels and Kegs in Merck's Packaging Program Reported—Foreign Bagging Methods for Superphosphate Explained—***

Merck & Co.'s uses for wooden barrels are described in the March issue of *The Wooden Barrel*, official organ of the Associated Cooperage Industries of America. For most chemicals, Merck finds that a slack barrel, properly lined with a crepe-type kraft bag, is low in price and a good tight bulk package to protect dry chemicals and semi-bulky products such as citric acid. Wooden kegs and barrels are used for the shipment of many valuable chemicals. These must be kept absolutely clean and free from contamination by dust particles.

Among the most interesting wooden barrel containers shipped into the Merck plant are kegs of crude iodine from South America. After these small kegs have been filled, they are completely wrapped with and sewn into green cowhides. The hides then shrink and prevent the escape of fumes.

Coopering In 90 Seconds

One department of Merck specializes in preparing barrels for shipment and so expert are the workmen that the average time consumed in coopering a barrel for shipment is only 90 seconds.

There has been much study and research in regard to improving wooden barrel service to the chemical trade. It has been found that a certain material, size, and type of construction are best suited for certain chemicals, although standardized measurements have not been established for all products. There is a kind of barrel best for packing each specific chemical.

Dry chemicals are shipped in slack barrels hooped with wood, wire, or flat steel. Heads are made of gum, cottonwood, yellow pine, basswood, and hardwoods. The length of the staves varies from 18 to 40 inches and the diameter of the heads from 11 to 24 inches. Because the density of chemicals varies considerably, careful specification is necessary to making estimates for slack barrels Although domestic shipments of dry chemicals usually move in slack barrels, tight cooperage is used for certain dry chemicals intended for export.

In making barrels for powdered chemical products, careful attention to timber and to manufacturing details such as kiln drying, pointing, trussing, heading, and hooping are necessary to make these barrels efficient against moisture. Staves are made of No. 1 timber, and 4 steel or 6 standard coiled elm hoops are used.

The cooperage industry aids barrel users in determining the size and type of slack barrels required for packing specific mineral and metal flour. Pigments are packed in barrels with staves 28½ and 30 in. and diameter of the heads, 17⅛ x 19⅛ in.

Other barrel-packed powdered chemicals include potash, alkali, carbon and graphite, dyestuffs, lead actetate, boiler compound, soap powder. Tight gumwood barrels with 6 hoops are used by lead manufacturers for red and white lead, litharge, and dry colors. Half-barrel gum staves are of the same thickness as whole-barrel staves—⅝ or ¾ in. as specified, and are 30 in. or under in length. The heads are 17½ in. in diameter and ⅝-in. thick. Oak or ash bung staves are used when desired. Other chemicals are mentioned, such as sodium benzoate, sal soda, "bicarb," sodium silicate, tartaric, lactic and phosphoric acids, ferric chloride, zinc chloride, etc.

Mechanical Bagging Methods in Denmark

Mechanical bagging methods employed in Danish superphosphate factories are described by K. Warming in the January issue of *Superphosphate*, the official organ of the International Superphosphate Manufacturers' Association. Equipment, developed by Warming, in collaboration with the Hamburg firm of Gebruder Burgdorf and the Danish firm of A.-S. Frichs, was first employed in the potash industry and then, much later, adopted for superphosphate producers.

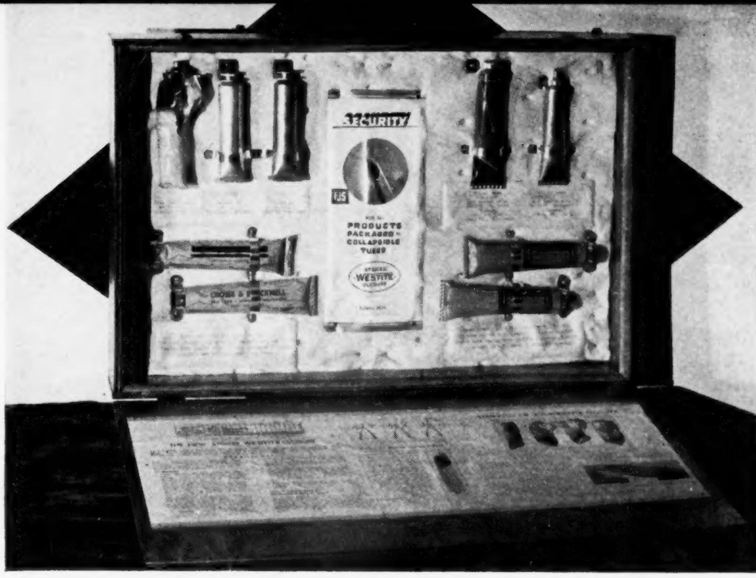
The apparatus has a vertical set of buckets which can be turned round a vertical main axis, the latter being fixed upon a movable under-carriage. The buckets scrape the material from the vertical side of the fertilizer pile by an upward movement, the elevator being moved alternately from one side to the other. During the scraping operation the under-carriage is driven towards the heap. The radius of action of the set of buckets is such that the excavation in the heap is wider than the under-carriage, thus allowing of the apparatus to be driven straight into the heap. The material (scraped by means of the set of buckets) falls through a slanting pipe (which can be turned) on the floor behind the apparatus where it was charged into sacks.

Changes In Superphosphate

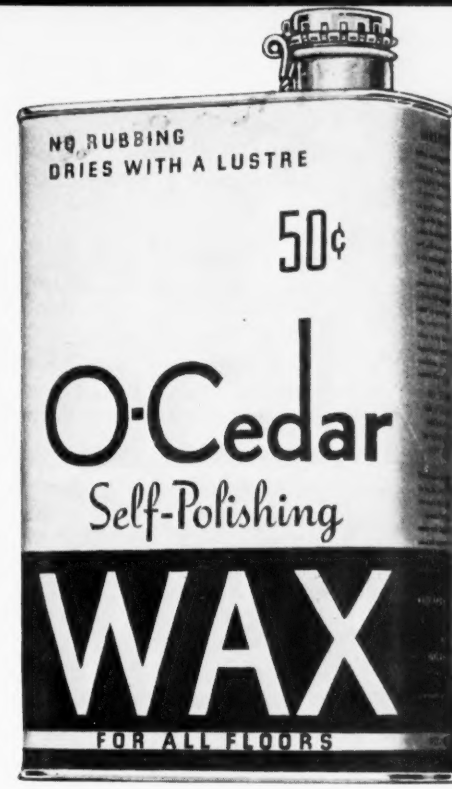
Certain changes were made for the superphosphate producers as follows: The movable buckets were so constructed that the series of buckets was not vertical, but slightly inclined forwards at an angle of about 82°. This improvement has stood the test of time, and has been retained up to the present as a collapse of the heap very rarely occurs during working hours. The scraped material falls on to a vibrating conveyor which has been enlarged in the shape of a sieve. The fine material is immediately conveyed to a silo, where it is charged into sacks; while the coarse material is first transported to a steel pin-crusher, and from there to the silo by means of a vibrating conveyor. The silo for charging the material into sacks at the back of the carriage is fitted with 2 pipes, which can be closed by means of sliding shutters; below these are 2 carriages containing the sacks. The bags are automatically sewed. Similar machines are used on the Continent for ammonium sulfate, sodium nitrate and other chemical and fertilizer materials.

Malcolmson Speaks at Packaging Conference

Robert Gair's J. D. Malcolmson spoke on "Opportunities and Problems in Packing and Shipping," before the recent Packaging Exposition and Clinic, held in Chicago, devoting most of his time to a discussion of the effect on shipping because of the greater speeds available now through modern transportation.



An exhibit that attracted wide attention at the Chicago Packaging Show of the American Management Association (generally known as the Woolf Awards) was that of the F. J. Stokes Machine Co., showing the "Westite" closure for tubes, C. J. Westin, chief designer.



This can label, designed for the O-Cedar Corp., Chicago, helped to win 3d place for Harry H. Farrell's display in the Chicago Society of Typographic Arts Exhibit.

The winner in the shipping-containers group at the recent Packaging Exposition of the American Management Association at Chicago—the 4-piece quickly removable tierce head with curled bilge hoops. Entered and used by Procter & Gamble, and designed by T. S. Eagen. The barrel also obtained honorable mention in the technical development group.

At the left, the container adopted by the A. S. Boyle Co., of Chicago, for a brand new product. Label was designed by S. S. Schroffenberger of the Boyle Company and the can is by American Can. Center, Puritan Soap, Rochester, introduces 2 new products to the trade. The Pre-Wax Cleaner can is by Giles Can of Chicago. The wax can is by Wilkes-Barre Can. Frederic Grover, Rochester, N. Y., was designer of both packages. Right, a winner in the recent Packaging Exposition—the molded-pulp dispensing container for oil—a development from the laboratories of National Folding Box, New Haven, Conn. So far, the idea has appealed mainly to the liquor and oil industries, but it presents interesting possibilities to the chemical specialty manufacturer who is looking for a substitute-proof container.

U. S. Chemical Patents

A Complete Check-List of Products, Apparatus, Equipment, Processes

Agricultural Chemicals

Apparatus for spraying obnoxious weed killing solutions, etc. No. 1,991,930. Edward Hope, Island Bay, Wellington, New Zealand.

Production homogeneous fertilizer salt mixtures. No. 1,989,756. Bethune G. Klugh, Birmingham, Ala., to Swann Fertilizer Co., Birmingham, Ala.

Method granulating calcium nitrate, containing from 20 to 50% calcium cyanamid, free water content being less than 1%, being free from unhydrated lime and physically stable. No. 1,989,684. Geo. E. Cox, Niagara Falls, N. Y., to American Cyanamid Co., New York, N. Y.

Cellulose

Process removing natural impurities from vegetable fibers; by use of an aqueous solution containing sodium hydroxide and true mahogany sulfonates. No. 1,991,335. Warren T. Reddish, Cincinnati, O., to Twitchell Process Co., St. Bernard, O.

Continuous method of producing cellulose; treating cellulose bearing material with a chemical in a digestion stage. No. 1,991,245. Joaquin Julio de la Roza, Sr., Plandome, N. Y., to de la Roza Corp., Wilmington, Del.

Apparatus and method for digesting cellulose bearing material. No. 1,991,244. Joaquin Julio de la Roza, Sr., New York, N. Y., to de la Roza Corp., Wilmington, Del.

Apparatus for producing cellulose. No. 1,991,243. Joaquin Julio de la Roza, Sr., Tuinucu, Cuba, to de la Roza Corp., Wilmington, Del.

Preparing cellulose solutions for use in manufacture of artificial threads, etc., using sulfuric acid. No. 1,991,141. Jan Cornelis de Nooij and Dirk Jan Gerritsen, Zutphen, Netherlands.

Preparation a cellulose nitrate multi-acylate; treating cellulose with a lower aliphatic acid, treating resultant product with a known liquid oxide of nitrogen, and at least one lower aliphatic acid anhydride of another aliphatic acid. No. 1,991,125. Cyril J. Staud and James T. Fuess, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Production finely divided cellulose organic ester molding powder of uniform composition and particle size in granular incolloidized form. No. 1,991,115. Dennis E. Northrup and Amos W. Crane, Kingsport, Tenn. to Eastman Kodak Co., Rochester, N. Y.

Preparation cellulose ester molding composition, comprising a cellulose ester and a diacyl ester of dioxanediol. No. 1,991,109. James G. McNally and John J. Schmitt, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Manufacture cellulose derivative composition; using a cellulose derivative and, as a plasticizer, an ester of a polycarboxylic acid. No. 1,989,701. Walter E. Lawson, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Removing catalyst from a spent liquor resulting from the esterification of cellulose fibrous form. No. 1,991,108. Carl J. Malm, Kingsport, Tenn., and Gale F. Nadeau, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Preparation in acetone-soluble organic acid ester of cellulose containing the acetyl and carbamyl groups. No. 1,991,107. Carl J. Malm and Gale F. Nadeau, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Process bleaching wood pulp and similar cellulose materials. No. 1,990,942. Clark T. Henderson, Burlingame, Cal.

Process for separation and recovery of neutral solvent and cellulose ester from a crude cellulose ester solution. No. 1,990,625. Wilhelm Walter, Cologne-Niehl, Rudolf Hofmann, Dormagen, and Fritz Oschatz, Mannheim, Germany, to I. G. Frankfort-am-Main, Germany.

Preparation mixed esters of cellulose; reacting a substance having the cellulose nucleus and containing free hydroxyl groups, with ketone and an organic acid other than acetic. No. 1,990,483. Geo. De Witt Graves, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Fireproofing and preserving cellulosic materials; using sodium stannate, a water-solution of a salt of a strong mineral acid with a weakly base-forming metal, chlorinated rubber, and coloring materials. No. 1,990,292. Martin Leatherman, Hyattsville, Md., dedicated to the free use of the public.

Process converting cellulose and like materials into sugar with dilute acids, under pressure. No. 1,990,097. Heinrich Scholler, Solln, near Munich, and Walter Karsch, Tornesch, Germany.

Chemical Specialties

Preparation leather dressing composition; being mixture of solid waxes in sperm and castor oils. No. 1,992,131. Emil Sajak, Dresden, Germany.

Process for applying glue to a glue-repellent material soluble in prolamin solvents. No. 1,992,122. Donald William Hansen, Decatur, Ill., to A. E. Staley Mfg. Co., Decatur, Ill.

Manufacture a polishing and waterproofing compound for wood; using spar varnish, China wood oil, petroleum naphtha, turpentine, manganese drier, and another drier, also paraffin wax. No. 1,992,010. Harvey G. Kittredge, Dayton O., to Kay & Ess Chemical Co., Dayton, O.

Manufacture of a waterproofing and polishing compound for wood. No. 1,991,752. Harvey G. Kittredge, Dayton, Ohio, to the Kay & Ess Chemical Corp., Dayton, Ohio.

Manufacture adhesive composition, adapted for bonding a surface covering to a moisture-containing sub-surface and permanently unaffected by moisture when hardened. No. 1,991,007. Robt. D. Bonney, Glen Ridge, and Arnaud G. de Boer, Kearny, N. J., to Congoleum-Nairn, Inc., New York, N. Y.

Manufacture transparent and colorless adhesive; first step milling raw rubber to plasticity; adding a resin, finally aging, re-milling and running same into solid, pliable sheets. No. 1,990,996. Julian Y. Malone, Milwaukee, Wis.

Preparation insecticidal dust and process of applying liquid insecticide; dusting parasiticide comprising a solid transient carrier of fine dust and a water insoluble parasiticidal liquid. No. 1,990,966. Wm. Hunter Volck, Watsonville, Cal., to California Spray Chemical Corp., San Francisco, Cal.

Production an insecticide; rendering a pressure distillate of shale oil miscible with water. No. 1,990,490. Joseph W. Horne and Carl P. Hopkins, Boulder, Colo.

Manufacture insecticide; being composition comprising pyrethrum extract and "Thioquinozole." No. 1,990,422. Robert C. White, Philadelphia, Pa.

Solution for hydraulic transmission of power, including furfural aldehyde and glycolmonoacetate. No. 1,990,149. Andrew T. K. Tseng, New York, N. Y., to Hydraulic Brake Co., Detroit, Mich.

Manufacture steel wool scouring pad, comprising steel wool fibers, coated with a film of mineral oil, mahogany soap, and oleic acid. No. 1,990,009. Harry G. Stiles, Chicago, Ill., to Standard Oil Co., Chicago, Ill.

Insecticide of jelly-like consistency, for ants; including sugar, honey, a thallium compound, agar, and water. No. 1,989,981. Clyde C. Hamilton, Highland Park, N. J., to Endowment Foundation, New Brunswick, N. J.

Manufacture permanently plastic, fireproof adhesive, formed of a solution of silicate of soda and an admixture of material chemically inert with respect to the solution and serving to give body and tensile strength to the adhesive. No. 1,989,833. Willis C. Ware, Chicago, Ill., one-half to Edward B. Sickle, Chicago, Ill.

Production sodium meta silicate detergent. No. 1,989,765. Henry V. Moss, St. Louis, Mo., and Foster Dee Snell, Brooklyn, N. Y., to Swann Research, Inc., Birmingham, Ala.

Production detergent; combining sodium silicate with caustic soda, incorporating trisodium phosphate into granular mass, exposing mixture while in dry state to action of chlorine gas, then coating with oleic acid. No. 1,989,759. Paul Logue, Birmingham, and Wm. N. Pritchard, Jr., Anniston, Ala., to Swann Research, Inc., Birmingham, Ala.

Apparatus and method for testing lubricants. No. 1,989,627. Edwin R. Sage, Jersey City, N. J., to Improved Devices, Inc., Brooklyn, N. Y.

Production improved natural waxes. No. 1,989,626. Wilhelm Pungs, Cologne, and Michael Jahrstorfer, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Production an adhesive base, composed of reaction products of a mixture of cellulose fiber and one or more hulls of seeds treated with caustic alkali and carbon bisulfide. No. 1,989,424. Geo. H. Osgood and Russell G. Peterson, Tacoma, Wash., said Peterson assignor to said Osgood.

Production laundry sour, comprising water-soluble compounds of fluorine and monoammonium phosphate. No. 1,989,312. Arthur B. Gerber, Anniston, Ala., to Swann Research, Inc., Birmingham, Ala.

Manufacture cup grease, using oil, water, lime and a hydrogenated fatty compound. No. 1,989,197. Wm. P. Hilliker, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Manufacture journal grease, using heavy black oil, heavy steam refined oil (530° F. flash), hydrogenated fatty acid, sodium hydroxide (48° Be.), and lard oil. No. 1,989,196. Wm. P. Hilliker, Hammond, Ind., to Standard Oil Co. (Indiana), Chicago, Ill.

Production glue base, consisting of a dry powdered starch containing an oxidizing agent, and urea. No. 1,989,150. Gordon G. Pierson, Lansdale, Pa., to Perkins Glue Co., Delaware.

Coal Tar Chemicals

Preparation alpha-naphthol; brominating naphthalene, reacting product with an aqueous hydrolytic base in presence of a copper-containing catalyst, finally separating alpha-naphthol from reaction product. No. 1,992,154. Edgar C. Britton and Wesley C. Stoesser, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Process separating N-mono-alkyl-aryl-amines of the benzene series from each other; using maleic anhydride, and an aqueous alkali solution. No. 1,992,111. Frithjof Zwilgmayer, So. Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Purification of tar acids; mixing acids with a free metal capable of evolving hydrogen on contact with an acid solution. No. 1,991,979. Carl E. Hartwig, Bayonne, N. J., to Barrett Co., New York, N. Y.

Preparation crystalline sodium 2, 4, 5-trichlorophenolate. No. 1,991,329. Lindley E. Mills, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Production arylide of pyrazalone-carboxylic acids. No. 1,991,313. Gerald Bonhote, Basel, and Max Schmid, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture 1-nitro-anthraquinone-6-carboxylic acid. No. 1,991,191. Earl Edson Beard, So. Milwaukee, and Ralph Norbert Lulck, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Aminic acids and process of preparing them. No. 1,991,783. Paul Whittier Carleton, Pennsgrove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process for separating mono- and dialkyl amines of the benzene series. No. 1,991,790. John Belmont Cook, Jr., and Donald Hutton, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method of making benzene from light oil. No. 1,991,843. Robert W. Campbell and Fred W. Wagner, Pittsburgh, Pa., to Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Manufacture of an ester of polycarboxylic acid. No. 1,991,391. Emmette F. Izard, Elsmere, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture of a protective bituminous substance or composition and method of making, having superior resistance to acids, alkalies, with heat

and sound insulating properties. No. 1,991,393. William W. Joyce, Chicago, to Al-Oys Inc., Chicago.

Purifying alkylated phenyl azoamino-pyridines; using a free base, acetone, and hydrochloric acid. No. 1,990,923. Edmond T. Tisza and Bernard Joos, Yonkers, N. Y., to Pyridium Corp., Nepera Park, N. Y.

Production bimolecular condensation products of methylene-anthrone. No. 1,990,842. Heinz Scheyer, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Production condensation products derived from glyoxal-dianthraquinone compounds. No. 1,990,841. Heinz Scheyer, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Production benzanthrone-carboxylic acid; using benzanthrone and carbon tetrachloride. No. 1,990,807. Viktor M. Weinmayr, Milwaukee, and John M. Tinker, So. Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture benzanthrone derivatives. No. 1,990,506. Henry J. Weiland, So. Milwaukee, and Viktor M. Weinmayr, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Separation hydrogen sulfide from a gas containing the same. No. 1,990,217. Hans Baehr and Helmut Mengdehl, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Bulk production of coumarone resin by catalytic polymerization. No. 1,990,215. Geo. Kenneth Anderson, Pittsburgh, Pa., to Neville Co., Pittsburgh, Pa.

Removal of substances forming resins from benzines. No. 1,990,213. Fritz Winkler and Hans Haeuber, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture a resin from a phenol of improved light resistance and reactivity under the action of heat; reacting a phenol with an aldehyde and ketone in presence of a basic contact agent. No. 1,989,951. Otto Sussenguth, Erkner, near Berlin, Germany, to Bakelite G. m.b.H., Berlin, Germany.

Preparation bituminous emulsion, using bitumen and an aqueous solution containing alkali metasilicate as emulsifying agent. No. 1,989,775. Preston R. Smith, Rahway, N. J., to Barber Asphalt Co., Phila., Pa.

Manufacture a neutral phthalic acid ester of a plurality of phenols of the benzene series. No. 1,989,699. Lucas P. Kyrides, Webster Groves, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Production dimethylol urea, by condensing theoretical proportions of urea and formaldehyde in an aqueous solution. No. 1,989,628. Matthias Schmihing, Ludwigshafen-am-Rhine, Germany, to Unyte Corp., New York, N. Y.

Process treating coke. No. 1,989,526. Alfred R. Powell, Oak Park, Ill., to Koppers Co. of Delaware, Pittsburgh, Pa.

Coking retort oven. No. 1,989,505. Raynard Christianson, Fort Wayne, Ind., to Koppers Co. of Delaware, Pittsburgh, Pa.

Retort for distillation of solid carbonaceous substances. No. 1,989,459. Chas. Henry Parker, Codsall, England, to Low Temperature Carbonisation, Ltd., London, England.

Production amine of high molecular weight, being a colorless or nearly colorless oily or solid substance, usually soluble in organic solvents. No. 1,989,325. Wilhelm Lommel, Leverkusen-Wiesdorf, and Rudolf Schroter, Leverkusen, Germany, to I. G., Frankfort-am-Main, Germany.

Process for recovery phenols from gas liquors. No. 1,989,177. Wm. Tiddy, Scarsdale, N. Y., to Semet-Solvay Engineering Corp., New York, N. Y.

Coatings

Treating sheets of wood; impregnating sheets with solution of a urea-thiourea resin. No. 1,991,056. Gerald H. Mains, Murrysville, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Production color, plastic and coating compositions; using a solution of a non-alkali forming metal salt of a keto acid in an organic solvent, with a solution in an organic solvent of a dye. No. 1,990,818. Lloyd C. Daniels, Crafton, and Alphons O. Jaeger, Mt. Lebanon, Pa., to American Cyanamid & Chemical Corp., New York, N. Y.

Production acid resisting vitreous enamel; using a frit composition containing in the melted bath zinc oxide, alkalies, lead oxide, alumina, silica, titanium dioxide, and zirconium oxide. No. 1,990,812. Perry G. Bartlett, and Harry C. Kremers, Phila., Pa., to Rohm & Haas Co., Phila., Pa.

Non-inflammable fireproof flexible coating composition; comprising pyroxylin solution, pigment, aluminum potassium sulfate, tricresyl phosphate, and triphenyl phosphate. No. 1,990,811. Erich K. Zimmerman, Passaic, N. J., to L. E. Carpenter & Co., Inc., Newark, N. J.

Apparatus for coating, impregnating, laminating, etc. No. 1,990,749. Ross S. Phillips, Cleveland, and Ray G. Carlin, Shaker Heights, Ohio, to Cleveland Liner & Mfg. Co., Cleveland, O.

Oil acid varnish; being mixture of free fatty oil acid and asphalt. No. 1,990,474. Alfonso M. Alvarado, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Coating composition comprising a film of forming material containing the acid radicals of drying oil, and asphaltene derived from asphalt by separating out the petroleum naphtha soluble constituents. No. 1,990,475. Alfonso Miguel Alvarado, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method causing a sheet containing cellulose acetate to adhere directly to a surface free from a derivative of cellulose. No. 1,990,098. Geo. W. Seymour, Cumberland, Md., to Celanese Corp. of America, Delaware.

Manufacture flexible and moistureproof article. No. 1,990,080. Lloyd L. Leach, Buffalo, and John C. Siemann, Kenmore, N. Y., to Du Pont Cellophane Co., Inc., New York, N. Y.

Treating galvanized sheets to prepare them for reception of organic coatings; immersing sheets in a solution of calcium hydroxide. No. 1,989,925. Geo. R. Hoover and Wm. E. Marshall, Middletown, O., to American Rolling Mill Co., Middletown, O.

Preparation a rapid drying coating composition; using an oil modified polyhydric alcohol- polybasic acid resin and a drier. No. 1,989,711. Paul Robinson, Llanerch, and Ben E. Sorenson, Phila., Pa., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture moistureproof, flexible, transparent and non-tacky coatings or films, using a compatible mixture of a lacquer base, wax, and a ketone acid. No. 1,989,683. Ralph T. K. Cornwell, Fredericksburg, Va., to Sylvania Industrial Corp., New York, N. Y.

Manufacture transparent and moistureproof sheet material, by impregnating a regenerated cellulose pellicle with a composition of a wax and a plasticizer in a liquid vehicle. No. 1,989,681. Wm. Hale Charch, Buffalo, N. Y., to Du Pont Cellophane Co., New York, N. Y.

Production transparent film; composition of a rubber hydrohalide and a substance of such clear character in such amount as to retard photochemical disintegration of the rubber hydrohalide. No. 1,989,632. Wm. C. Calvert, Cuyahoga Falls, Ohio, to Wingfoot Corp., Wilmington, Del.

A spray coating exhaust system, having channels with openings arranged to discharge a pneumatic curtain at each side of the object to be coated. No. 1,989,270. Albert R. Clark, Toledo, Ohio, to the De Vilbiss Co., Toledo, O.

Dyestuffs

A disazo dye and method for its preparation. No. 1,991,505. Henry Jordan, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Vat dyestuff and intermediate of the pyrenequinone and perylenequinone series. No. 1,991,687. Ralph N. Luick and Melvin A. Perkins, Milwaukee, to E. I. du Pont de Nemours & Co., Wilmintgon, Del.

Preparation Indanthrene Blue; wherein 2-amino-anthraquinone is reacted with fused caustic alkali. No. 1,990,954. Wilfred M. Murch, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Vat and sulfur dyestuff printing preparations for textiles; using as printing assistant a compound of the group of beta-arylsulfamino-anthraquinones, and such reduction products of these compounds as still contain oxygen in the meso-position. No. 1,990,854. Hermann Berthold, Leverkusen-I. G., Werk-am-Rhine, Germany, to General Aniline Works, New York, N. Y.

Production a carbocyanine dye. No. 1,990,681. Frank L. White, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Manufacture chromiferous dyestuffs by the action of agents yielding chromium on mixtures of monoazo-dyestuffs capable of being chromed. No. 1,990,257. Fritz Straub, Basel, and Hermann Schneider, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production unsymmetrical indigoid dyestuffs, yielding yellow to red to brown vats from which cotton is dyed pink to orange to red-brown to violet tints. No. 1,990,256. Ernst Stoecklin, Binningen, near Basel, Hans Veraguth, Basel, and Fritz Grieshaber, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Preparation asymmetrical indigoid dyestuffs. No. 1,990,010. Ernst Stocklin, Binningen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture non-dyeing metalliferous derivatives of phenols. No. 1,989,989. Valentin Kartaschoff, Basel, Switzerland, to Chemical Works, formerly Sandoz, Basel, Switzerland.

Preparation vat and sulfur dyestuffs for tetxile printing, using a compound of the group consisting of pyridine betaine and its salts. No. 1,989,784. Hermann Berthold, Leverkusen-I. G. Werk, and Eduard Albrecht, Frankfort-am-Main, Fechenheim, Germany, to General Aniline Works, Inc., New York, N. Y.

Manufacture chromiferous dyestuffs. No. 1,989,570. Fritz Straub, Basel, and Hermann Schneider, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture of chromiferous dyestuffs from mixtures of azo-dyestuffs capable of being chromed. No. 1,989,569. Fritz Straub, Basel, and Hermann Schneider, Riehen, near Basel. Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture chromiferous dyestuffs. No. 1,989,568. Fritz Straub, Basel, and Hermann Schneider, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Process preparation chromiferous azo-dyestuffs. No. 1,989,567. Fritz Straub, Basel, and Hermann Schneider, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Improved process production dry diazo-preparations. No. 1,989,541. Jules Blanchod, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production vat dyestuffs of the 1, 2-benzanthraquinone series. No. 1,989,493. Heinrich Neresheimer, Ludwigshafen-am-Rhine, Willy Eichholz, Mannheim, and Georg Boehner, Edingen-am-Neckar, Germany, to General Aniline Works, New York, N. Y.

Production azo-dyestuffs, being generally dark powders, soluble in water. No. 1,989,472. Heinrich Clingestein, Cologne-am-Rhine, and Myrtil Kahn, Cologne-Riehl, Germany, to General Aniline Works, Inc., New York, N. Y.

Explosives, etc.

Process reducing nitroguanidine to aminoguanidine by the use of zinc in presence of an aqueous solution of a metal acetate in the substantial absence of free acetic acid. No. 1,990,511. Joseph A. Wyler, Allentown, Pa., to Trojan Powder Co., New York.

Fine Chemicals

Manufacture tertiary-alkyl-substituted aromatic derivatives. No. 1,991,-332. Ralph T. Perkins, Andrew J. Dietzler, and Jos. T. Lundquist, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Preparation organic antimony compounds, yielding with water stable solutions; dissolving antimony oxyhydrates in solutions of salts formed by interaction of quinine with polyhydroxymono-carboxylic acids derived from aldoses. No. 1,991,283. Walter Kussmaul, Basel, Switzerland, to Chemical Works formerly Sandoz, Basel, Switzerland.

Manufacture photographic emulsion. No. 1,991,136. John G. Capstaff, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

A germicide produced from a mineral oil. No. 1,991,590. Wallace J. Yates, Martinez, Calif., to Shell Development Co., Los Angeles, Calif.

Manufacture of aromatic selenium compounds. No. 1,991,646. Alexander J. Wuertz, Carrolville, Donald P. Graham, South Milwaukee and Melvin A. Perkins, Milwaukee, to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production a photographic developer, comprising a silver-halide developing agent and a metaborate. No. 1,990,800. Harold D. Russell, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Production a photographic gelatino-silver-halide emulsion containing a carbocyanine dye which contains two selenazoline nuclei. No. 1,990,682. Frank L. White, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Photographic gelatino-silver-halide emulsion containing a cyanine dye. No. 1,990,507. Frank L. White, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Stoichiometrically composed sodium salt of a complex compound of antimony with an aliphatic hexahydroxy hexane, said product being soluble in water. No. 1,990,442. Wilhelm Traube and Fritz Kuhbier, Berlin, Germany, to Winthrop Chemical Co., Inc., New York, N. Y.

Preparation p-(N-sec-alkyl-amino) phenols; reducing p-niroso-phenols in presence of dialkyl ketones. No. 1,989,707. Randolph T. Major, Plainfield, N. J., to Merck & Co., Rahway, N. J.

Glass

Manufacture laminated glass; using in process dibutyl phthalate, monoethyl ether of diethylene glycol, diethylene glycol, and nitrocellulose. No. 1,989,959. Geo. B. Watkins, Toledo, O., to Libbey-Owens-Ford Glass Co., Toledo, O.

Process and apparatus for producing safety glass. No. 1,989,388. Geo. B. Watkins, Toledo, Ohio, to Libbey-Owens-Ford Glass Co., Toledo, O.

Apparatus for applying a bond-inducing medium to sheets for use in

the manufacture of laminated glass. No. 1,989,268. Bernard C. Case and Conrad B. Schafer, Toledo, Ohio, to Libbey-Owens-Ford Glass Co., Toledo, O.

Industrial Chemicals, Apparatus

Preparation wetting, emulsifying, and washing agent. No. 1,992,160. Charles A. Thomas, Wayne, Pa., to Sharples Solvents Corp., Phila., Pa.

Process for recovery of cyanide and metal values from cyanide solutions which have been used for the extraction of precious metals. No. 1,992,060. Thomas Ewan and Reginald John Lemmon, Norton-on-Tees, England, to Imperial Chemical Industries, Ltd., London, England.

Process oxidizing arsenious acid; introducing air under pressure into an aqueous system of arsenious acid and iodine. No. 1,992,053. Ernest R. Boller, Cleveland Heights, O., to Grasselli Chemical Co., Cleveland, O.

Metal cleaning and rust preventing solution; comprising aqueous phosphoric acid and a sulfonated glycerid of a high molecular fatty acid. No. 1,992,045. Wm. K. Schweitzer, East Cleveland, O., to Grasselli Chemical Co., Cleveland, O.

Process fatty acid cracking in presence of aromatic amines. No. 1,991,956. Anderson W. Ralston, Chicago, Ill., to Armour & Co., Chicago, Ill.

Process pyrolytically treating higher fatty acid substances to form useful products. No. 1,991,955. Anderson W. Ralston, Chicago, Ill., to Armour & Co., Chicago, Ill.

Process reacting an olefine having more than 2 carbon atoms with sulfuric acid of concentration below 90%. No. 1,991,948. Kenneth B. Lacy, Highland Park, Ill., to Van Schaack Bros. Chemical Works, Chicago, Ill.

Preparation waterproofing and polishing compounds for wood; comprising a spar varnish of rosin ester, China wood oil and sulfur; and a non-inflammable penetrating waterproofing and polishing compound of petroleum naphtha, a drier, carbon tetrachloride and paraffin wax. No. 1,992,020. Albert J. Turner, and Harvey G. Kittredge, Dayton, O., to Kay & Ess Chemical Co., Dayton, O.

Manufacture a substantially non-drying printer's ink adapted for thermography; using a water insoluble resin as a body and a plasticizer as a base. No. 1,992,016. Adolf Schneider, Jackson Heights, N. Y.

Manufacture an acid precipitated casein of relatively low acid and ash content; using skim milk and an acid during process. No. 1,992,002. Frank L. Chappell, Hobart, N. Y., to Sheffield Farms Co., New York, N. Y.

Preparation of a squalene derivative; using squalene-hexahydrobromide, glacial carbolic acid, anhydrous aluminum chloride, and a weak caustic soda solution. No. 1,991,999. Hugh Mills Bunbury, Prestwich, Manchester, and Wilfred Archibald Sexton, Huddersfield, England, to Imperial Chemical Industries, Ltd., London, England.

Method plating iron with aluminum. No. 1,991,994. Anton Wimmer, Dortmund, Germany.

Process for polymerizing unsaturated gases to low boiling liquids. No. 1,991,354. Wm. B. Plummer Chicago, Ill., and Vanderveer Voorhees, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Method improving lime mortars and plasters; using a soluble magnesium salt and a compound from the group of citric, phosphoric and tartaric acids and the alkali-metal and ammonium salts of such acids. No. 1,991,338. Leroy C. Stewart, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Composition of matter comprising partially hydrated solid flake or granular particles composed of calcium chlorate and calcium chloride. No. 1,991,325. Sheldon B. Heath, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Production mixed cellulose esters; first step alkali cellulose being esterified with anhydrides of such fatty acids which have 2 to 5 carbon atoms; in second step, product obtained in first step being converted into soluble product by further treatment with formic acid in presence of a substance having a mineral acid reaction. No. 1,991,323. Robt. Haller, Riehen, near Basel, and Andreas Ruperti, Basel, Switzerland, to Society of Chemical Industrial in Basle, Basel, Switzerland.

Precipitating beryllium hydroxide from an alkaline aqueous solution containing beryllium associated with the negative radicals of strong mineral acids. No. 1,991,269. Harry Howard Armstrong, Los Angeles, Cal.

Extraction beryllium values from an ore such as beryl; using sodium fluoride and silicon tetrafluoride during process. No. 1,991,272. Harry C. Claflin, Cleveland, and Deane O. Hubbard, Oberlin, Ohio, to Beryllium Corp., New York, N. Y.

Refrigerant mixture for absorption type of refrigeration apparatus, consisting of β, β' dichlorethyl ether as solvent, and methyl chloride as refrigerant. No. 1,991,240. Glenn F. Zellhoefer, Bloomington, Ill.

Refrigerant mixture for absorption type of refrigeration apparatus, consisting of alpha chlornaphthalene as solvent, and methyl chloride as refrigerant. No. 1,991,188. Glenn F. Zellhoefer, Bloomington, Ill.

Manufacture a nickel catalyst adapted for hydrogenation of unsaturated fatty oils and the like. No. 1,991,096. Carey B. Jackson, Chicago, Ill., to Catalyst Research Corp., Balto., Md.

A plastic packing stuffing box. No. 1,991,714. Harley T. Wheeler, Dallas, Tex.

A composition for molding under heat and pressure comprising a substantially dry and pulverulent mixture of pentamethylenediamenedisulfine and a filler material. No. 1,991,398. Max Landecker, Germany, to American Cyanamid Co., N. Y. City.

Process for crystallizing borax from solutions. No. 1,991,410. Alfred Newman, Long Beach, Calif., to Pacific Coast Borax Co., a corporation of Nevada.

Method impregnating carbonaceous brushes with abrasive material. No. 1,991,487. Arthur S. Nemis, St. Marys Pa., to Speer Carbon Co., a corporation of Pennsylvania.

Method of milling diatomaceous earth. No. 1,991,583. McKinley Stockton, Los, Angeles, Calif., to the Dicalite Co., Los Angeles, Calif.

Application of mud-laden fluids to oil or gas wells comprising a suspensible base and an added concentrated colloidal suspending agent therefor. No. 1,991,637. Phillip E. Harth, St. Louis, to National Pigments & Chemical Co., St. Louis.

Process of preparing a dry color material. No. 1,991,647. William A. Adamson, South Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Alpha, alpha anthracene-dicarbonyl-chloride and process of preparing the same. No. 1,991,688. Ralph N. Lulck and Melvin A. Perkins, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

A plastic molding apparatus. No. 1,991,706. Ralph L. Seabury, Anderson, Ind., to General Motors Corp., Detroit, Mich.

Lead salt of dinitrobenzoic acid and a priming composition. No. 1,991,730. Willi Brun, Bridgeport, Conn., to Remington Arms Co.

Process for the production of formic acid. No. 1,991,732. Gilbert B. Carpenter, Bellemoor, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process for the preparation of alkyl aryl ketones according to the Friedal and Crafts Reaction. No. 1,991,743. Philip H. Groggins, Washington, to the Sec. of Agriculture of the U. S.

Process for the concentrating of sulfuric acid and sludge acid. No. 1,991,745. Ingenuin Heckenbleikner, Charlotte, N. C., to Chemical Construction Corp., N. Y. City.

The aldehyde-hydrogen sulfide reaction product. No. 1,991,765. Barnard M. Marks, Arlington, N. J., to the du Pont Viscoloid Co., Wilmington, Del.

Manufacture of the bismuth salts of organic carboxylic acids. No. 1,991,783. Max Bockmuhl and Walter Persch, Frankfort-am-Main, Germany, to Winthrop Chemical Co., N. Y. City.

A mercury boiler. No. 1,991,798. George D. Ebbets, Kenilworth, N. J., to the Babcock & Wilcox Co., Bayonne, N. J.

Process of making vulcanizable mixtures by incorporating a colloidal aqueous dispersion resulting from the polymerization of a diolefine in aqueous emulsions with carbon black without coagulation of the polymerized diolefine and then precipitating. No. 1,991,367. Arthur Beck and Martin Mueller, Cunradi-Ludgwigshafen, Germany, to the I. G. Farbenindustrie.

A method for improving the sweattability of a wax through the introduction of a percentage of needle wax. No. 1,991,389. Lawrence M. Henderson, Henry C. Cowles, Seymour W. Ferris, to the Atlantic Refining Co., Philadelphia.

Laminated material; sheets cemented together by a heat hardened binder. No. 1,991,090. Wm. E. Gwaltney, Trafford, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Production anhydrides of lower aliphatic carboxylic acids; thermally decomposing corresponding acids in presence of a difficultly decomposable sulfate of a metal at least as electronegative as aluminum. No. 1,991,085. Henry Dreyfus, London, England.

Production concentrated lower aliphatic acids from their aqueous solutions. No. 1,991,084. Henry Dreyfus, London, England.

Preparation cellulose ester composition, comprising a plasticizing substance consisting of at least one of the following: para toluene sulfonyl N-ethyl acetamid and para toluene sulfonyl acetanilid. No. 1,991,012. Thos. S. Carswell and Wm. Gump, St. Louis, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Preparation artificial resin; bringing into reaction metal salts of phenol methylols and polyhydric aliphatic alcohols, part of whose hydroxy groups is replaced by halogen. No. 1,990,985. Ewald Fonrobert and Fritz Lemmer, Wiesbaden, Germany, to Resinous Products & Chemical Co., Phila., Pa.

Preparation ethylidene chloride; reacting vinyl chloride with hydrogen chloride in presence of zinc chloride. No. 1,990,968. Johan Pieter, Wibault, Amsterdam, and Jan van Dalfsen, Rotterdam. Netherlands, to Dow Chemical Co., Midland, Mich.

Manufacture of solid fuel briquette; comprising coal and a binder, binder containing Portland cement. No. 1,990,948. Leverett I. Loghry, Portsmouth, O., to Superior Cement Corp., Portsmouth, O.

Apparatus for treating gas, carrying suspended dust. No. 1,990,943. Geo. H. Horne, Glendale, and Marcel A. Lissman, Los Angeles, Cal., to International Precipitation Co., Los Angeles, Cal.

Production glycerol; fermenting a solution of yeast fermentable sugar by means of yeast to produce glycerol. No. 1,990,908. Wm. F. Krug, Jr., Wilmington, and Frank A. McDermott, Claymont, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture cellulose ethers; producing an ethyl ether of cellulose, adding to reaction mixture a dispersing agent of an aqueous solution of Turkey red oil. No. 1,990,904. Fred. Chas. Hahn, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture denture, comprising a vinyl resin identical with a resin resulting from the conjoint polymerization of a vinyl halide and a vinyl ester of an aliphatic acid. No. 1,990,903. Frazier Groff, Charleston, W. Va., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Manufacture aliphatic acid anhydrides. No. 1,990,902. Stanley Joseph Green, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Process forming potassium sulfate by the chemical reaction of potassium chloride and sodium sulfate decahydrate; which includes adding water to a dry mixture of said salts. No. 1,990,896. Geo. A. Connell, San Pedro, Cal., to Pacific Coast Borax Co., Nevada.

Acetylene generator. No. 1,990,857. Mike Czap, Akron, Mich.

Production alcohols from olefines by absorption of latter in acid, followed by hydrolysis. No. 1,990,789. Siefried L. Langedijk, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Cal.

Production a plurality of amino acids from proteins, and separating them from each other. No. 1,990,769. Harold M. Barnett, Cleveland, O., to S. M. A. Corp., Cleveland, O.

Preparation an artificial zeolite; using sodium aluminate and sodium silicate. No. 1,990,751. Oliver C. Ralston, Clarkdale, and Kenneth Michael Baum, Yuma, Ariz.; Emmet J. Culligan, administrator of said Kenneth M. Baum, deceased, assignor of entire right of said Baum to Arizona Minerals Corp., Yuma, Ariz.

Manufacture abrasive product; incorporating naphthalene with rubber, finally mixing the liquefied rubber with abrasive particles, synthetic resin and a vulcanizing agent. No. 1,990,737. Jos. N. Kuzmick and Jos. A. Lange, Passaic, N. J., to Raybestos-Manhattan, Inc., Passaic, N. J.

Method detecting leaks in a closed system containing a halogen derivative. No. 1,990,706. Thos. Midgely, Jr., Worthington, O., to General Motors Corp., Detroit, Mich.

Fluorating a halogenated aliphatic hydrocarbon containing halogen other than fluorine; adding free chlorine to the reaction zone. No. 1,990,692. Albert L. Henne, Columbus, O., to General Motors Corp., Detroit. Mich.

Preparation a polymeric vinyl resin fraction having a substantially uniform and relatively high fusion point; using a vinyl chloride, vinyl acetate, a polymerizing catalyst, and a solvent. No. 1,990,685. Charles O. Young and Stuart D. Douglas, Charleston, W. Va., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Manufacture briquettes from comminuted woody material. No. 1,990,-632. Robert T. Bowling. Lewiston, Idaho, to Wood Briquettes, Inc., Lewiston, Idaho.

Production wax; causing an alkylene oxide, in which the oxygen atom is connected to two vicinal carbon atoms, to react on a wax at a temperature between 100 and 200° C. No. 1,990,615. Herbert Rodrian, and Arnold Doser, Cologne-Mulheim, and Rudolf Bauer, Cologne-Deutz, Germany, to I. G., Frankfort-am-Main, Germany.

Purification sulfur. No. 1,990,602. Ernest W. Guernsey and Richard E. Vollrath, Balto., Md., to Consolidated Gas, Electric Light & Power Co., Balto., Md.

Electrolytic reduction of a non-acid electrically conducting aqueous mono-saccharide solution as the catholyte in an electrolysis cell. No. 1,990,582. Henry Jermain Creighton, Swarthmore, Pa., to Atlas Powder Co., Wilmington, Del.

Cyanide process and apparatus. No. 1,990,559. Louis D. Mills, Thos. B. Crowe, and Luther W. Lennox, Palo Alto, Cal., to Merrill Co., San Francisco, Cal.

Apparatus for mixing and kneading plastic materials. No. 1,990,555. Evarts G. Loomis, Newark, N. J.

Preparing directly a combustible mixture of gases composed largely of methane. No. 1,990,523. Arthur M. Buswell, Urbana, and Clair S. Boruff, Monmouth, Ill.

Production asphaltic products from an aromatic extract of a mineral oil, obtained by refining the crude oil with a non-reactive selective solvent of the aromatic and unsaturated hydrocarbons. No. 1,990,466. Hugh Logie Allan, Syriam, Burmah, British India, to Burmah Oil Co., Ltd., Glasgow, Scotland.

Manufacture urea-formaldehyde condensation products. No. 19,463. Reissue. Kurt Ripper, Berlin, Germany, to American Cyanamid Co., New York, N. Y.

Scum removing apparatus for settling tanks and the like. No. 1,990,458. Wm. B. Marshall, Milwaukee, Wis., to Chain Belt Co., Milwaukee, Wis.

Production an imido alkylol wherein at least 2 carbon atoms separate the imido nitrogen atom from the hydroxyl group of the contiguous alkylol radical. No. 1,990,453. Walter J. Hund and Ludwig Rosenstein, San Francisco, Cal., to Shell Development Co., San Francisco, Cal.

Manufacture briquettes. No. 1,990,405. Wm. L. Hoernle, Trenton, N. J.

Preparation condensation products; combining polymerized vinyl esters with an aldehyde in a solvent reactive medium. No. 1,990,399. Maurice Belloc, Paris, France, to Societe Nobel Francaise, Paris, France.

Preparation Shiraz or Karaya gum for printing on fabrics; cooking gum in an acid medium, neutralizing a portion of the acid, precipitating impurities and metallic salts, then filtering the gum. No. 1,990,330. Philip Kaplan, Brooklyn, N. Y., to Richards Chemical Works, Inc., Jersey City, New Jersey.

Polarizing electrolyte mixture, consisting of gum arabic, an electrically conductive glycerine, and powdered oxide. No. 1,990,274. Philip E. Edelman, Chicago, to Robert T. Mack, trustee, Chicago, Ill.

Production sorbitol by acting on glucose with hydrogen in presence of water and a reducing catalyst. No. 1,990,245. Johannes Mueller, Eppstein, and Ulrich Hoffmann, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture phosphoric acid. No. 1,990,233. Ingenuin Hechenbleikner, Charlotte, N. C., to Chemical Construction Corp., Charlotte, N. C.

Manufacture of carbon black of great uniformity and fineness from that obtained by thermal decomposition of hydrocarbons. No. 1,990,228. Gustav Adolph Frenkel, Oakland, Cal., to Shell Development Co., San Francisco, Cal.

Method removing iron and manganese from water. No. 1,990,214. Carl Zapffe, Brainerd, Minn.

Production a plastic, comprising free sulfur and a normally hard olefine-polysulfide plastic containing 63 to 75% combined sulfur. No. 1,990,203. Joseph C. Patrick, Trenton, N. J.

Production a normally hard, thermoplastic olefine-polysulfide reaction body containing about 63 to 70% combined sulfur. No, 1,990,202. Joseph C. Patrick, Kansas City, Mo.

Manufacture fluoranthene compounds. No. 1,990,018. Alfred Bergdolt, Cologne-am-Rhine, and Fritz Ballauf, Cologne-Mulheim, Germany, to General Aniline Works, Inc., New York, N. Y.

Preparation primary acid amides containing more than 7 carbon atoms, using urea and a monocarboxylic acid. No. 1,989,968. Herman A. Bruson, Germantown, Pa., to Resinous Products & Chemical Co., Phila., Pa.

Production anthraquinone-acridone imide compounds. No. 1,989,904. Alex. J. Wuertz, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Removing impurities from mica; treating crude mica ore with a solution of potassium cyanide. No. 1,989,830. Julius T. Stroehlke, Silver Cliff, Colo.

Destructive hydrogenation of distillable carbonaceous materials. No. 1,989,822. Mathias Pier, Heidelberg, Germany, to Standard-I. G. Co., Linden, N. J.

Method acid leaching granular materials. No. 1,989,789. Joshua A. Crew, Zanesville, O.

Method for formation of a reflecting surface; by reacting a silver salt with an amino alcohol. No. 1,989,764. Max Meltsner, New York, N. Y.

Manufacture aldehydic compositions by the superatmospheric pressure reaction of carbon monoxide, aluminum chloride and a carbon-hydrogen compound. No. 1,989,700. Alfred T. Larson, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Apparatus for effecting chemical reactions by the use of contact masses. No. 1,989,692. Eugene J. Houdry, Paris, France, to Houdry Process Corp., New York, N. Y.

Mixing apparatus. No. 1,989,668. Fritz Garthe, Frankfort-am-Main, Germany.

Production gypsum plaster; using calcined calcium sulfate, a set-stabilizing composition containing a retarder, lime, and an acid-reacting soluble sulfate. No. 1,989,641. Geo. D. King, Chicago, Ill., to U. S. Gypsum Co., Chicago, Ill.

Apparatus and method for reduction of granular materials. No. 1,989,615. Geo. L. Hann, New Brighton, S. I., N. Y., to U. S. Gypsum Co., Chicago, Ill.

Production alkali metal hydrates from alkali metal salts. No. 1,989,579. Friedrich Bartling, Huglfing, Germany, Jenny Bartling, executrix of said Friedrich Bartling, deceased, to Alterum Kredit-Aktiengesellschaft, Berlin, Germany.

Manufacture compressed substances; reacting a primary aromatic amine, an aldehyde and filling material in the absence of solvents, under heat and mechanical pressure. No. 1,989,543. Hermann Burmeister, Hennigsdorf, near Osthavelland, Germany, to General Electric Co., Schenectady, N. Y.

Production metal sulfates from sludge acid obtained from treating petroleum products with sulfuric acid. No. 1,989,512. Willy Glaser, Ober-Rochlitz, Czechoslovakia.

Device for promoting chemical reactions, and particularly the combustion of mixtures of gases and other materials, such as vapors, liquids, and colloids. No. 1,989,499. Rene Charles Sabot, Paris, France.

Method removing from a well, by treatment with an acid, a deposit soluble in acid with liberation of gas. No. 1,989,479. John J. Grebe, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Solvent composition which is non-inflammable and non-explosive over its entire evaporating range, using a petroleum distillate, carbon tetrachloride, and tetrachlorethylene. No. 1,989,478. John J. Grebe, Sylvia M. Stoesser, and Lindley E. Mills, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Production 1 (nitro-phenyl)—nitro or halo—mercaptobenzothiazoles. No. 1,989,469. Jan Teppema, Akron, Ohio, to Wingfoot Corp., Wilmington, Del.

Production butylene from ethylene. No. 1,989,425. Michael Otto and Leopold Bub, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Prevention deposit and growth of slime-forming organisms on the surfaces of condensers and heat exchange apparatus, using chloramines. No. 1,989,380. Isabella B. Romans, Tuckahoe, N. Y.

Manufacture an emulsion of bitumen and hard water, using fluoride of an alkali metal and saponifiable material. No. 1,989,374. Kenneth E. McConnaughay Indianapolis, Ind., to Pre Cote Corp., Indianapolis, Ind.

Production graphite writing and drawing leads, by incorporating with a graphite lead composition a fatty material containing fat soluble coloring matter. No. 1,989,370. Karl Kreutzer, Nuremberg, Germany, to J. S. Staedtler, Nuremberg, Germany.

Separation diacetylene from gas mixtures containing acetylene, first washing mixture with a quantity of a solvent. No. 1,989,273. Walter Grimme, Oberhausen-Sterkrade-Nord, and Heinrich Tramm, Oberhausen-Holten, Germany.

Treatment gas mixtures, containing nitrogen oxides, oxygen, and water-vapor to form nitric acid and liquid nitrogen tetroxide. No. 1,989,267. Nikodem Caro and Albert Rudolf Frank, Berlin, and Rudolf Wendlandt and Thos. Fischer, Piesteritz, near Wittenberg, Germany.

Production offset printing ink; composed of pigment, linseed oil, varnish, castor oil, stearine, and turpentine. No. 1,989,250. Chas. P. Shaw, Detroit, Mich., to Detroit Moulding Corp., Detroit, Mich.

Preparation homogeneous and amorphous plastic composition, using rubber and a vinyl resin. No. 1,989,246. Marion C. Reed, Charleston, W. Va., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Manufacture a moldable composition, using a mixture of granular filler, a powdered solid resin of a heat-hardening type, and a solvent for the resin. No. 1,989,243. Clarence A. Nash, No. Caldwell, and Rupert S. Daniels, Newark, N. J., to Bakelite Corp., New York, N. Y.

Apparatus for separating low boiling gas mixtures. No. 1,989,190. Mathias Frankl, Augsburg, Germany, to American Oxythermic Corp., New York, N. Y.

Production a chemical compound by inter-action of an acid and an alkali contained under pressure, and exerting a refrigerating effect when released from pressure. No. 1,989,175. Herman B. Siems, Chicago, Ill., to Swift & Co. Fertilizer Works, Chicago, Ill.

Production non-structural activated carbon, suitable for refining, purifying and decolorizing. No. 1,989,108. Jacque C. Morrell, Oak Park, Ill.

Manufacture activated carbon, comprising non-structural activated product of a mixture of vegetable char, a mineral carbon, and a uniformly distributed carbonized bituminous binder. No. 1,989,107. Jacque C. Morrell, Oak Park, Ill.

Leather, Tanning

Increasing storing capacity of undressed mineral tanned leather; impregnating leather with a mixture of neutral alkali salts of aromatic sulfo acids and other soluble carbohydrates than alkyl cellulose. No. 1,990,391. Rudolf Sajitz, Berlin, Germany, to Chemische Fabrik Pott & Co., G. m. b. H., Pirna-Copitz, Germany.

Preparation water soluble synethetic resinous tanning material, consisting of a condensation product of an aldehyde, an aromatic sulfonic acid and one of the group of salicylic, parahydroxybenzoic acids, and parachlorphenol. No. 1,989,802. Wm. F. Hester, Drexel Hill, Harry R. Raterink, Phila., and Ian C. Somerville, Fox Chase, Pa., to Rohm & Haas Co., Phila., Pa.

Metals, Alloys, etc.

Manufacture hard copper-zinc alloys; using nickel, aluminum, zinc, and copper. No. 1,992,118. Henry Winder Brownsdon, Moseley, Birmingham, Maurice Cook, Newport Pagnall, and Herbert John Miller, Fellings Park, Wolverhampton, England, to Imperial Chemical Industries, Ltd., London, England.

Production of an article having a nitride hardened surface, consisting of a steel alloy. No. 1,991,977. Adolf Fry, Essen, Germany, to Nitralloy Corp., Delaware.

Process electrodepositing a platinum metal; electrolyzing an aqueous solution containing an amino-cyanide of a platinum metal. No. 1,991,995. Edmund M. Wise, Westfield, N. J., to International Nickel Co., New York, N. Y.

Production protective coatings for metal surfaces; depolymerizing caoutchouc, and mixing this with molten bitumen. No. 1,991,300. Gustav Tichy and Heinrich Klas, Dusseldorf, Germany.

Process for improving copper-titanium alloys. No. 1,991,162. Wilhelm Kroll, Luxemburg, Luxemburg, to Metal & Thermit Corp., Carteret, N. J.

Process for the treatment of metal which comprises deforming the metal with a die in the presence of a mineral lubricant. No. 1,991,395. Cyril Kocour, Chicago.

Method and apparatus for producing low carbon metal. No. 1,991,008. Herman A. Brassert, Chicago, Ill., to H. A. Brassert & Co., Chicago, Ill.

Preparation pickling bath for metals; containing a non-oxidizing mineral acid and the reaction product of a mercaptazole, formaldehyde, and an ammonium sulfide. No. 1,990,963. Jan Teppema, Cuyahoga, Falls, O., to Wingfoot Corp., Wilmington, Del.

Manufacture heat resistant alloy; composed of aluminum, chromium, manganese, silicon, titanium, and iron. No. 1,990,650. Hans Jaeger, Milwaukee, Wis., to A. O. Smith Corp., Milwaukee, Wis.

Manufacture carburized alloy steel. No. 1,990,647. Herbert Harris, Milwaukee, Wis., to A. O. Smith Corp., Milwaukee, Wis.

Manufacture alloy steel; using chromium, nickel, nitrogen, and iron. No. 1,990,590. Russell Franks, Jackson Heights, N. Y., to Electro Metallurgical Co., Charleston, W. Va.

Recovery metal values from oxidized and non-sulfide ores. No. 1,990,299. Ralph F. Meyer, Freeport, Pa., to Meyer Mineral Separation Co., Pittsburgh, Pa.

A soldering flux comprising glucamine. No. 1,990,273. Harry B. Dykstra, Wilmington, Del., to Grasselli Chemical Co., Cleveland, O.

Improving properties of copper; alloying same with beryllium and nickel, subsequently heating at temperatures between 350 and 900° C. No. 1,990,168. Michael G. Corson, Jackson Heights, N. Y., to Electro Metallurgical Co., Charleston, W. Va.

Preparation coating for foundry ores containing mica and clay. No. 1,990,075. Julius J. Horak, San Francisco, Cal., to Quandt Chemical Co., San Francisco, Cal.

Manufacture bimetallic article; consisting of a steel base having a coating in direct engagement therewith, coating being a binary alloy of lead and sodium. No. 1,990,070. Herbert W. Graham and Samuel L. Case, Pittsburgh, Pa., to Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Method annealing ferrous articles; immersing articles in molten sodium carbonate. No. 1,989,884. Gustav A. Reinhardt, Youngstown, O., to Youngstown Sheet & Tube Co., Youngstown, O.

Production bismuth from a bismuth-lead alloy. No. 1,989,734. Jesse O. Betterton and Yurii E. Lebedeff, Metuchen, N. J., to American Smelting & Refining Co., New York, N. Y.

Preparation a solid ignition composition; having as ingredients selenium and metal from the tin and lead group. No. 1,989,729. Harvey B. Alexander, Kingston, N. Y., to Hercules Powder Co., Wilmington, Del.

Preparation flux for soldering objects sensitive to corrosion, consisting of colophony and diphenylguanidine. No. 1,989,557. Richard E. Muller, Berlin-Wilmersdorf, Germany, to Kuppers Metallwerke, G. m. b. H., Bonn, Germany.

Flux for smelting and refining magnesium and magnesium alloys; being mixture of halogen compounds of magnesium, and manganese compounds having an oxygen content. No. 1,989,456. Alex. Luschenowsky, Berlin, Germany.

Production zinc base alloy containing aluminum, copper, and zinc metal. No. 1,989,308. Wm. Waite Broughton, Hohokus, N. J., and Geo. L. Werley, Palmerton, Pa., to New Jersey Zinc Co., New York, N. Y.

Naval Stores

Manufacture rosin size; dispersing rosin in presence of clay in a slightly alkaline aqueous medium. No. 1,990,457. Geo. James Manson, Hawkesbury, Ont., Canada, to Manson Chemical Co., New Jersey.

Method refining rosin; by treatment simultaneously with resorcinol and sulfur dioxide gas. No. 1,990,367. Joseph N. Borglin, Marshallton, Del., to Hercules Powder Co., Wilmington, Del.

Pulp and Paper

Method of reclaiming pulp from waste paper. No. 1,991,823. Francis H. Snyder, Niagara Falls, N. Y., to Snyder Maclaren Processes, Inc., a corporation of Delaware.

Process de-inking paper which bears a carbon ink; acting upon paper with an aqueous solution containing soap and one or more chlorinated hydrocarbons. No. 1,990,376. Henry B. Hass, West Lafayette, Ind., to Purdue Research Foundation, West Lafayette, Ind.

Manufacture paper, comprising felted organic fibrous material and finely divided diatomaceous earth that has been calcined in finely divided form. No. 1,989,709. Carlton J. O'Neil, Plainfield, N. J., to Johns-Manville Corp., New York, N. Y.

Apparatus and method bleaching and refining pulp. No. 1,989,571. Carl Busch Thorne, Hawkesbury, Ont., Canada.

Rubber

Process for thickening latex. No. 1,991,402. John McGavack, Leonia, N. J., to U. S. Rubber Co., N. Y. City.

Process rubber vulcanization wherein scorching is prevented or diminished; by use of dibenzthiazyl disulfide and tetraethylthurian disulfide with one another as vulcanization accelerators. No. 1,990,906. Maldwyn Jones, Crumpsall, and Wm. Johnson Smith Naunton, Prestwich, England, to Imperial Chemical Industries, Ltd., London, England.

Process reclaiming rubber; heating fiber-containing vulcanized scrap with a small amount of caustic alkali. No. 1,990,658. Gilbert F. Lane, Akron, Ohio, to Phila. Rubber Works Co., Akron, Ohio.

Vulcanization accelerator. No. 1,990,610. Helmuth Meis, Leverkusen-Wiesdorf, Germany, to I. G., Frankfort-am-Main, Germany.

Process rubber vulcanization. No. 1,990,609. Helmuth Meis, Leverkusen-Wiesdorf, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture sponge rubber from latex or rubber solutions. No. 1,990,460. Henry R. Minor, Oak Park, Ill., to Liquid Carbonic Corp., Chicago, Ill.

Increasing resistance of rubber to deterioration due to aging, by incorporating with the rubber a monohydroxy-diaryl-methane. No. 1,989,788. Wm. S. Calcott and Wm. A. Douglass, Penns Grove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Increasing rate of creaming latex. No. 1,989,241. John McGavack, Leonia, N. J., to U. S. Rubber Co., New York, N. Y.

Method accelerating vulcanization rubber, containing a vulcanizing agent and zinc oxide, with p, p′ -diamino-diphenyl methane as sole added organic accelerator material. No. 1,989,226. Clyde Coleman, Passaic, N. J., to U. S. Rubber Co., New York, N. Y.

Soap

Process producing powdered soap of low moisture content. No. 19,456. Reissue. Benjamin Clayton, Sugarland, Tex., Walter B. Kerrick, Los Angeles, Cal., and Henry M. Stadt, Glendale, Cal., to Refining, Inc., Reno, Nevada.

Textile

Method for producing silk-like luster by coating. No. 1,991,809. Leon Lillienfeld, Vienna, Austria.

Process delustering lustrous textiles; fixing a water-insoluble aluminum salt of an aromatic o-dicarboxylic acid at least on a portion of the textile. No. 1,990,864. Herbert Gensel, Cologne-Mulheim, and Rudolf Bauer, Cologne-Deutz, Germany, to General Aniline Works, Inc., New York, N. Y.

Production alkaline pastes for printing or discharging on wool, containing an alkali metal salt of amino acetic acid. No. 1,990,852. Max Zabel, Dessau in Anhalt, Oskar Falek, Wiederitzsch, near Leipzig, and Hans Seifert, Gut Steinfurth, Post Wolfen, near Bitterfeld, Germany, to General Aniline Works, Inc., New York, N. Y.

Apparatus for simultaneously spinning, twisting, and purifying rayon. No. 1,990,617. Marshall T. Sanders, Wilmington, Del., and Ralph A. Hales, Passaic, N. J., to Atlas Powder Co., Wilmington, Del.

Treatment tin weighted fibers; first with a zinc salt in a buffer solution, then in a solution of sodium silicate. No. 1,990,450. Olav Berg, Paterson, Max Imhoff, Clifton, and Oernulf E. Heiberg, Hawthorne, N. J.; said Heiberg assignor to said Berg and Imhoff; Albert Catalane and Wm. W. Evans executors of said Olav Berg, deceased.

Treatment tin weighted fibers; using solution of an organic zinc salt. No. 1,990,449. Olav Berg, Paterson, Max Imhoff, Clifton, and Oernulf E. Heiberg, Hawthorne, N. J., said Heiberg assignor to said Berg and Imhoff; Albert Catalane and Wm. W. Evans, executors of said Olav Berg, deceased.

Producing ornamental effects on fabrics, including cellulose acetate, using a medium of pine oil, and subjecting fabric before drying to steam to develop design. No. 1,989,209. Winfred Maxwell Mitchell, Hopewell, Va., and Henri Louis Barthelemy, Rome, Ga., to Tubize Chatillon Corp., New York, N. Y.

Treatment artificial fibrous material, made from viscose, using a caustic alkali solution. No. 1,989,101. Leon Lilienfeld, Vienna, Austria.

Treatment artificial fibrous material of regenerated cellulose, using caustic alkali solution and an alkali metal sulfide solution. No. 1,989,100. Leon Lilienfeld, Vienna, Austria.

Process increasing extensibility of artificial threads of high dry tenacity, produced from viscose, by coagulation with a strong mineral acid. No. 1,989,099. Leon Lilienfeld, Vienna, Austria.

Process increasing extensibility of artificial threads of high dry tenacity, produced from viscose, by means of a coagulating bath of strong mineral acid. No. 1,989,098. Leon Lilienfeld, Vienna, Austria.

Water Treatment

Sewage digestion; treatment of sewage and the like polluted waste waters. No. 1,989,589. Anthony J. Fischer, Jackson Heights, and Nels B. Lund, Seaford, N. Y., to The Dorr Co., Inc., New York, N. Y.

Grading and Uses of Talc

A report by Dr. C. A. MacConkey, Division of Research Information, of the National Research Council, on "Grading and Uses of Talc," shows that Canada, producing ten to fifteen thousand metric tons yearly, mines only a small fraction of the world total. Since, however, the uses of talc are quite diversified, the development of new fields and attention to the technique of grading by existing producers might appear warranted.

In the United States in 1931, the distribution of ground talc sold to various industries was as follows:

Paint	48%
Paper	16%
Roofing	11%
Rubber	11%
Toilet Preparations	3%
Foundry Facings	1%
Ceramics	1%
Miscellaneous	9%

It will be noted that the cosmetic industry, in which the very high-priced and high-quality ground talc is used, represents only 3% of the total market.

Characteristics which come into consideration in the determination of grades are: color, fineness of grain, "slip," "retention," lime, iron and silica content, grittiness, specific gravity, freedom from mica particles, and acid-soluble matter, "unctuousness," and "lustre," capacity to absorb and hold perfumes, behavior under heat, etc. The importance of many of these properties to different industries varies, and it would, therefore, be difficult to set up standard specifications which would receive general acceptance. Since 1925, however, some firms have begun to buy on a basis of physical and chemical analysis. The possibility of selling on such a basis has probably never been seriously considered in Canada.

Following is a list of uses, together with characteristics important to these uses:

Crayons, pencils, insulators, gas-burner tips, etc.:—Lava grade, purity, fineness of grain; must be homogeneous, compact, fairly soft, without cleavage, free from water, grit and iron.

Cosmetics:—Whiteness, "unctuousness," very fine grain, freedom from grit, silica, calcite, lime, glittering mica particles, iron and acid soluble matter, capacity for absorbing and holding perfumes and for not causing the skin to become shiny.

Paint:—Apparent specific gravity.

Electrical insulators:—High dielectric and tensile strength. Specifications for steatite insulators are said to be very exacting, and it has been claimed that suitable talc is found in only one locality in the world.

Ceramics:—Color, texture, chemical analysis, accurately controlled grain size.

Concrete admixture:—Not coarser or finer than 99% through a No. 200 sieve.

Lubricants, polishing agents and phonograph records:—Hardness.

Textile filler:—Soft, greasy, smooth feel, and freedom from gritty impurities.

Filtering medium (U. S. Pharmacopoeia):—When ignited at red heat, it must not lose more than 5% of its weight, must pass a No. 80 sieve and be retained by a No. 100.

For roofing and foundry facings:—Off-color talc can be used.

—*Canadian Chemistry & Metallurgy*, March, 1935, p. 85.

Chemical Markets & News

Railroads Win a Partial Victory in Request for Higher Rates—Many Chemicals Included in Items Raised Through I. C. C. Ruling—American Chemical Society Prepares for Biggest Meeting in Its History—

The Interstate Commerce Commission, on Mar. 31, denied the petition of the railroads for a flat 10% increase in rates but authorizes increases totaling $85,000,000 on some commodities until June, 1936. This decision has been awaited with a great deal of anxiety on the part of industry in general and, of course, by executives in the chemical industry where products, generally speaking, are relatively cheap and bulky. The original application of the roads sought increases which would have totalled about $170,000,000.

Rate increases allowed represent resumption of the so-called emergency surcharges which were in effect from Jan. 4, '32, until Sept. 30, '33. Some variations were made in the new charges compared with earlier emergency list.

Coal Bears Brunt

Burden of the higher rates will rest most heavily on the coal industry, which is the largest customer of the railroads. Major farm products were exempted from the increase. Higher rates apply, among other classes of traffic, to coal and coke, petroleum products, iron ore, sand and gravel.

Commission's rejection of the plea of the carriers for the flat 10% increase and resumption of the emergency charges designed to aid the roads in meeting fixed charges was a 5 to 4 decision.

The chemical industry has more than a passing interest in the rate increases allowed. Aside from those on such products as coal, used by the industry in large quantity for manufacturing purposes, the following items are noted in the I. C. C. ruling: cotton linters, noils and regins, not bleached or dyed, 3c; cottonseed meal and cake, 3c; vegetable oil cake and meal, 3c; flaxseed, 2c; products of agriculture, N. O. S., viz.: pomace, 3c; beet pulp 2c; copra, 3c; meal (bean, clover, kapok seed, pea, peanut vine, rape seed, sorghum, velvet bean), 3c; peanut hulls or chaff, 2c; pomace, grape or castor bean, 3c; residue, beet, 2c; animal products, N. O. S., feeds, viz.: Blood flour, blood meal, buttermilk, condensed or dried, tankage, fish meal, fresh scrap and meat scrap or refuse; hoofs, horns, 3c; fleshings (glue stock), 2c.

Ores and concentrates, N. O. S., 2c; asphalt (natural, by-product, or petroleum, including gilsonite); pitch or tar (coal, gas house, fuel, paving petroleum, hardwood or roofing), 1c; salt, 2c; phosphate rock, crude (ground or unground); also phosphate rock sinter, colloidal phosphate, phosphate sand, 1c; sulfur, 2c; asphalt rock, dolomite, not roasted, marl, agricultural limestone, 1c; barytes and barytes ore, 2c; rosin, 4c; products of forests, N. O. S., briquettes, wood charcoal; charcoal, wood, 2c; petroleum oils, refined, including blended gasolines and coal tar benzine (benzol), 1c; tin, 2c; copper; ingot, matte and pig, 2.5c.

Lead and zinc, ingot, pig or bar, 2.5c; aluminum, ingot, pig or slab, 2.5c; lime, common, chemical or fluxing (hydrated, quick or slacked), 1c; fertilizers, N. O. S., 2c; sulfuric acid, 3c; pyrites, cinder, refuse or gross, 2c; rosin sizing, 4c; salt cake, 2c; tanning extract, 3c; wood pulp, 1c.

Specific emergency charge rates, carloads, were petroleum, crude, 1c per 100 lbs.; molasses (blackstrap), viz.:

Molasses or syrup, final or residual (beet, cane or corn), 1c per 100 lbs.; lignin liquor or pitch, 1c per 100 lbs., and iron ore (not ground) including iron sinter and concentrates 10c per net ton.

Emergency charges per net ton on anthracite and bituminous coal are 3c where rate per net ton is 75c or less; 5c from 76c to $1; 10c from $1.01 to $1.50, and 15c over $1.50.

300 Years "Young"

Alchemy flourished in old N. Y., researches by the Tercentenary Committee of the A. C. S. show. Wall Street was the center of this activity, but the rise of property values in this area proved more profitable to the alchemists than their efforts to transmute base metals into gold and silver.

Among the old records disclosed by the N. Y. chemists in their quest for historical documents to be exhibited at the celebration in N. Y. City, April 22 to 26, of the 300th anniversary of the founding of the nation's chemical industries is a diary of President Ezra Stiles of Yale University. This diary reveals that the practice of alchemy prevailed not only in New England, but existed in New York, Pennsylvania, and other colonies to the South.

Researches of the A. C. S. assembling historical exhibits for the tercentenary celebration have discovered in the archives of the Massachusetts Historical Society what they declare to be "the Magna Charta of chemistry in America."

Characterized as "the most priceless volume in the history of American chemistry," the ancient manuscript comprises a collection of English and Latin tracts upon alchemy, many of them in verse, which belonged originally to John Winthrop, Jr., the first colonial governor of Connecticut. Linking contemporary science with the medieval alchemy of Europe, it passed through generations of Winthrop descendants. Since 1869 it has reposed in the Historical Society's collections.

Of folio size, the volume is written in varied handwriting upon paper which would crumble with age except for recent reconditioning assuring its indefinite survival. Many of the 320 pages have so suffered from dampness as to be almost undecipherable.

Plans in Final Stages

Plans for the greatest meeting in the history of the A. C. S. are now in final form and the chemists and industrialists of N. Y. City and surrounding areas are eagerly awaiting the opening of the monster gathering. N. Y. City will go chemical in a "big" way and the nation will be "chemically conscious" for the week of Apr. 22 to 26.

The Hotel Pennsylvania is designated as headquarters for the A. C. S. and will be the focal point of the 5,000 to 8,000 that are expected to attend from all parts of the U. S. and Canada and also a number of foreign countries. The highlights of the meeting are expected to be: the Nichols Medal award to Father Julius Nieuwland of Notre Dame, at a dinner at the Pennsylvania, Apr. 23 and the Society dinner on Apr. 24 at the Waldorf at which Francis P. Garvan will preside and principal speakers will include Sen. Pat Harrison and Rep. James W. Wadsworth.

Stressing the Industrial Side

The industrial side of the chemical industry is having its "innings" at the Tercentenary meeting. William B. Bell, Cyanamid president, also president of the Chemical Alliance and the M. C. A., will speak on "National Planning and the Chemical Industries." Symposiums will be held on "Economic Problems of the Chemical Industry"; "Depreciation and Obsolescence Charges under the New Deal"; "What the Chemical Industry Is Doing for the Nation"; "Foreign Problems Confronting the Chemical Industry." Chemical prices, protective tariffs, materials of construction, are a few of the other "live" subjects to be discussed by outstanding leaders.

Women's Committee

Mrs. Francis P. Garvan is appointed honorary chairman of the women's committee to aid in the celebration. Mrs. Charles F. Roth is vice-chairman.

Mrs. Garvan and her committee associates are arranging a 5-day program for the women from all parts of the country who will come to New York to participate in the conclave, planned as the largest in the history of chemical science.

Members of the women's committee are Mmes. Carl G. Amend, Henry Atherton, Charles V. Bacon, Ross A. Baker, William B. Bell, Linzee Bladgen, Marston T. Bogert, Nicholas Brady, Benjamin T. Brooks, Frank Cheney, Joseph H. Choate, George O. Curme, Walter Damrosch, John W. Davis, Harry du Pont, Henry C. Enders, Colin G. Fink, P. K. Frolich, John W. Hammond, Williams Haynes, Arthur E. Hill, A. W. Hixson, Elon H. Hooker, Colgate Hoyt, Martin H. Ittner, Daniel D. Jackson, D. H. Killeffer, S. D. Kirpatrick, Percy E. Landolt, A. C. Langmuir, V. K. La Mer, James A. Lee, William Goadby Loew and H. B. Lowe.

Also Mmes. A. E. Marshall, George W. Merck, Floyd J. Metzger, James A. Miller, D. P. Morgan, A. Cressy Morrison, J. M. Nelson, A. B. Newman, Eleanor D. Newman, John C. Olsen, H. C. Parmelee, Robert Patchin, Edwin Potter, Harold Pratt, R. R. Renshaw, H. C. Sherman, Foster Dee Snell, S. D. Swan, W. A. Thomas, Joseph Truesdale, Carll Tucker, J. Watson Webb, J. M. Weiss, Gerald A. Wendt, Milton C. Whitaker, Harry Payne Whitney, Payne Whitney, Joseph Wilshire, W. W. Winship and F. G. Zisser.

Junior members of the committee include the Misses Margaret Brooks, Rachel Hixson, Lillian Moore and Lucienne Thomas.

Chemical Employment Declines

Chemical factory employment showed a slight decline from Dec. 15 to Jan. 15, a drop of 0.5 being reported by the Bureau of Labor Statistics. At the end of the period, employment stood 0.4 above the corresponding level for '34. Payroll totals in chemical factories decreased 0.2% during the monthly period, but stood 8.3% above the corresponding level of '34.

Obituaries

¶German Industrial Chemical Circles Profoundly Moved by Loss of Duisberg, I. G. Head—Other Deaths—

Dr. Carl Duisberg, 73, Germany's leading chemical industrialist, head of the I. G., on Mar. 18 at his home at Leverkusen, near Cologne. Technically trained he became an outstanding chemist in the dye field early in life, many of his discoveries being considered highly important. His company formed the basis upon which the huge I. G. was formed.

He was a pioneer in chemical science and a successful industrial organizer and economic leader who for a long time was head of the National Federation of German Industry. In the last-named capacity Dr. Duisberg was an enthusiastic supporter of the now defunct German Republic, although at times he sharply criticized its economic policies. In addition, Dr. Duisberg was a generous promoter of German science, and its disciples often called him the "student father."

Upon the merger of the leading German dye factories into the I. G. Farbenindustrie A. G. in 1912, he was made chairman of the supervisory board, and in 1925 was appointed administrative counsel of the industry, which had developed into the biggest capitalistic undertaking in Germany. He was chairman of the Reich Federation of German Industry from 1925 to 1933, member of the Reich Health Bureau, Privy Councilor and member of the Cologne Railway Council.

As general manager of the Friedrich Bayer concern Dr. Duisberg built its great plant at Leverkusen on the Rhine.

During the World War, Dr. Duisberg proved his ability as an organizer. He welded the principal dye producers of the Reich into one great enterprise, and by 1916 this organization formed a close association of various producers of chemicals whose sole interest was the supply of chemicals and the invention and manufacture of Ersatz materials for the armies of the Central Powers.

Philip McKim Garrison

Philip McKim Garrison, 65, secretary of Merck & Co., on Mar. 20, following a months illness from anemia. He was first in the building field and nearly 25 years ago joined the Merck organization, holding several positions of importance and responsibility before being elected secretary.

David A. Kemper

David A. Kemper, 45, an outstanding technologist and authority on activated carbon, recently, of a throat ailment. He was a gradrate of Cornell, Brooklyn

Outstanding activated carbon expert

Polytechnic and Columbia. He was with at various times, National Lead; Marden, Orth and Hastings; West Virginia Pulp and Paper. After leaving the service he researched for General Norit (N. V. Algemeene Norit Maatschappij), and within a few years was appointed American manager and technical director. He returned to Industrial Chemical in '28 as director of the technical department but was forced to resign in '30 because of poor health. But just recently he entered the technical field again as supervisor of the activated carbon developments of Cleveland-Cliffs Iron.

He was a Fellow of the American Institute of Chemists and charter member of its N. Y. Chapter; member of the Chemists' Club, Alpha Chi Rho, Chicago Drug and Chemical Association and American Legion. He had also held active membership in the A. C. S., American Oil Chemists' Society and other technical and scientific groups.

George Lieb Harrison

George Lieb Harrison, 99, retired chemical manufacturer of Philadelphia, on Mar. 9, a grandson of John Harrison who founded the famous firm of John Harrison & Sons and who is considered one of the earliest chemical pioneers. George Leib Harrison retired in '05 and in '18, company, then known as Harrison Brothers & Co., was sold to the du Pont's for nearly $6,000,000.

Other Deaths in March

Thomas Hersom, Jr., president of Thomas Hersom & Co., New Bedford, Mass., and one of the outstanding leaders in National Fertilizer Association circles, on Mar. 8, following an illness of 4 months.

Dr. George F. Richmond, head of Colgate-Palmolive-Peet's chemical department, on Mar. 21.

Richard Ziesing, 75, retired zinc refining expert of Grasselli Chemical, on Mar. 9, at his Florida home following a heart attack.

William Schaffer, 65, research chemist for the Schaffer Process Co., of Buffalo, on Mar. 14, following an illness of 2 months. He specialized in minerals, oils and clays.

Hanson D. Ferrell, 50, chief chemist, Alden Hosiery Mills, New Orleans, on Mar. 23.

Robert Lee Upshur, 72, retired president of R. L. Upshur Guano, Norfolk, Va., on Mar. 8 after a long illness.

Herbert Z. E. Perkins, former chief chemist for American Sugar, on Mar. 19.

Foreign

¶*I. G. Continues to Spend Large Sums in Plant Expansion—Statement by the D. E. N. Group on Nitrogen Prices — Commercial Solvents Builds—*

In '34 the I. G. continued to spend large sums for erection of plants and the overhauling and improvement of equipment, notwithstanding they have complained of a much reduced export trade. In '33, according to Consul Sydney Redecker, the I. G. appropriated 40,000,000 marks, double the '32 figure, for construction of new plants, and 83,000,000 marks for repairs and improvements, a gain of 17,000,000 marks; these figures were greatly increased in '34 to 120,000,000 marks for new construction and 130,000,000 for general repairs and improvement. It is believed that the largest part was for improvement in the synthetic gasoline and viscose fiber branches. The number of wage earners in I. G.'s chemical plants was also augmented by 27,535 additional persons and subsidiary mining enterprises by 4,844 employees. It would appear that the total number of persons in I. G.'s employ at the end of '34 was only slightly fewer than the peak number of 154,596 reached at the end of '28.

Nitrogen Quotas Explained

German-British-Norwegian bloc of the international nitrogen cartel (so-called D. E. N. group) releases a statement, apparent object of which is to show that other cartel members have little cause for dissatisfaction with respect to the quotas assigned to the minority production group. It reports that all European producers will utilize in '34-'35 only 29.5% of production capacity, in contrast with an average of 34.3% in '33-'34. D. E. N. will average only 19% of capacity during the current fiscal year, in contrast with 25% in '33-'34 and 27% in '32-'33. In France, where complaints have been registered concerning low production quotas, plants are operating at 48% of capacity. Figures for other countries are—Italy 73%, Czechoslovakia 92%, and Switzerland 64%. In Netherlands, the Sluiskil plant is operating on a 77% schedule, while other Netherland plants are on a 64% basis.

Solvents Builds in Britain

Commercial Solvents is reported as building a plant in Liverpool, England, for the manufacture of butanol and acetone. It is thought that one or possibly 2 English chemical companies are co-operating and that an English company will be formed to operate the plant.

English Notes

I. C. I. is reported ready to establish a soda ash plant at Port Adelaide, Australia, in the very near future.

W. A. S. Calder, delegate director of the General Chemicals Group of Imperial Chemical Industries, Ltd., has been elected president of the Society of Chemical Industry for the year 1935-36.

Other New Foreign Plants

The S.A. Elettrica ed Elettrochimica del Caffaro of Milan has received permission to erect a plant for the production of potassium permanganate at its electrochemical works in Brescia.

Japanese synthetic methanol production is now so large leading producers, Nippon Gosei Kogyo; Nippon Methanol K. K.; and Nippon Chisso Hiryo K. K. are requesting an import duty.

First Soviet plant for the production of acetone and butanol by the fermentation went into production last December.

COMING EVENTS

Southern Textile Exposition, Greenville, S. C., Apr. 8-13. Also Greenville Section of the A. C. S.

Akron Rubber Group, Apr. 12.

Second Annual Greater Philadelphia Safety Conference, Apr. 15-16.

A. C. S., 89th meeting, N. Y. City, Apr. 22-27.

All-Ohio Safety Congress, Neil House, Columbus, Ohio, Apr. 23-25.

U. S. Chamber of Commerce, Washington, D. C., Apr. 29-May 2.

New England Sewage Works Association, Hotel Continental, Cambridge, Mass., Apr. 29.

Natural Gasoline Association, Hotel Tulsa, Tulsa, Okla., May 1-3.

Tanners' Council of America, Spring Meeting, Waldorf-Astoria, N. Y. City, **May 1-2.**

Piedmont Section, American Association of Textile Colorists and Chemists, Poinsett Hotel, Greenville, S. C., May 4.

New England Safety Conference, Statler Hotel, Boston, May 6-7.

American Water Works Association, annual meeting, Netherland Plaza, Cincinnati, May 6-10.

Fifth Annual National Premium Exposition, Palmer House, Chicago, May 6-10.

13th Annual Midwest Safety Conference, Stevens Hotel, Chicago, May 8-9.

Chicago Rubber Group, May 10.

Joint Production and Chemical Conference, American Gas Association, N. Y. City, May 13-15.

American Institute of Chemical Engineers, spring meeting, Wilmington, Del., May 14-16.

Associated Cooperage Industries of America, Hotel Jefferson, St. Louis, May 14-16.

Maryland-Delaware Water and Sewage Association, Annapolis, Md., May 16-17.

Boston Rubber Group, May 17.

20th Annual International Convention and Inform-a-Show, National Association of Purchasing Agents, Waldorf-Astoria, N. Y. City, May 20-23.

American Society of Refrigerating Engineers, annual convention, Statler, Detroit, May 22-29.

American Association of Cereal Chemists, Denver, June 4.

Canadian Chemical Association, Kingston, June 4-6.

Synthetic Organic Chemical Manufacturers' Association, June outing, Skytop Lodge, Skytop, Pa., June 6-8.

Manufacturing Chemists' Association, annual meeting, Skytop Lodge, Skytop, Pa., June 6.

American Electroplaters' Society, annual meeting, Bridgeport, Conn., **June 10-14.**

American Leather Chemists' Association, Annual Convention, Skytop Lodge, Skytop, Pa., **June 12-14.**

Twelfth Colloid Symposium, Cornell, June 20-22.

American Society for Testing Materials, annual meeting, Book-Cadillac, Detroit, June 24-28.

Penn. Sewage Wks. Association, State College, Pa., June 24-26.

International Agricultural-Chemical Congress, Brussels, Belgium, July 15-28.

A. C. S., 90th Meeting, San Francisco, week of Aug. 19.

American Petroleum Institute, Biltmore Hotel, Los Angeles, Nov. 11-14.

Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 2-7.

Sixth National Organic Chemistry Symposium, Rochester, N. Y., Dec. 30.

Chemical Engineering Congress, Central Hall, Westminster, England, June 23-27, 1936.

LOCAL TO NEW YORK*

April 27 (entire day and evening). Newark Branch, American Electroplating Society, Hotel Douglas, Newark, N. J.

May 3. N. Y. Section, American Institute of Chemists.

May 10. Joint meeting, 4 technical societies, with Society of Chemical Industry in charge.

May 24. N. Y. State Sewage Works Association, Poughkeepsie, May 24-25.

Secretaries of Chemical Associations and Groups allied to chemistry (also the process industries) are urged to make use of this column.

*** Chemist Club unless otherwise stated.**

Foreign Trade

¶*Our Export Trade Increases in January—German Dye Exports in '34 7% Ahead of '33—English Paint Imports—*

Our foreign trade in chemicals and allied products (exports and imports), increased in January, former advancing 4% and the latter 17% in value over January of last year. Exports of chemical and allied products during January were valued at $8,776,000, compared with $8,417,000 for the same month of last year. Imports advanced from $5,626,000 to $6,597,000.

Among exports, industrial chemicals led the list with an advance of 33% to $1,845,000, followed by naval stores which increased 12% to $1,215,000; industrial chemical specialties, 28% to $1,003,000; and pigments, paints, and varnishes, 4½% to $1,063,000. Soaps and toilet preparations were up 16% in value to $484,000; and fertilizer exports increased 10½% in value to $664,000 and from 417,000 to 484,000 tons in quantity.

Exports of coal tar products during January declined 20% in value to $1,182,000 and sulfur shipments to foreign countries dropped from 47,000 to 20,000

tons in quantity while the value was down 54% to $402,000.

All major groups of chemical imports advanced in January, compared with January, 1934. Receipts for consumption of industrial chemicals increased 36% to $1,503,000; fertilizers and materials 7% in value to $3,003,000 and 10% in quantity to 154,000 tons; and coal tar products imports were 28% higher in value reaching $1,292,000.

German Dye Exports Stand Out

German dye exports increased 7% to 143,396,000 reichsmarks in '34 while exports of all other chemical groups declined, according to a report from Consul Sydney B. Redecker, Frankfort-on-Main, made public by the Commerce Department's Chemical Division. This increased trade was due entirely to a marked recovery in foreign sales of aniline and sulfur dyes, the latter going largely to the Far East, particularly China, Japan, and British India, to color cotton piece goods.

Exports of these 2 groups during '34 were valued at 120,242,000 reichsmarks compared with 108,703,000 reichsmarks for the preceding year and the quantity increased from 20,714 to 27,034 metric tons, statistics show.

Sales to China increased from 6,281,000 reichsmarks in '33 to 12,793,000 reichsmarks in '34, to British India from 7,756,000 to 10,542,000 reichsmarks, and to Japan from 4,754,000 to 5,808,000 reichsmarks. Exports of these dyes to Netherlands India, however, declined from 2,201,000 to 1,801,000 reichsmarks. Germany's dye sales to Argentine and Brazil increased almost 10% but shipments to the U. S., Canada, and Mexico contracted, after showing gains in '33.

In Europe increases were registered in sales to Great Britain, Austria, Czechoslovakia, Sweden, Rumania, Switzerland, and Belgium, but declines occurred in shipments to France, Italy, Netherlands and Hungary.

The U. S. was Germany's seventh best customer for aniline and sulfur dyes in '34, according to the report, taking 660 metric tons, valued at 5,132,000 reichsmarks, compared with 884 tons, valued at 7,917,000 reichsmarks, in 1933. The Reichsmark was worth approximately 39c in '34; 30c in '33.

England Buys Heavily

With the exception of bronze powders, imports of paint products into England have recorded an almost unbroken trend of increase during the past 3 years. Total imports of paint products into England during '34 were valued at £1,553,324 compared with £1,162,277 for the preceding year, with approximately one-third originating in the U. S. each year. Carbon black ranked first in '34. Imports of this material were valued at £559,096 compared with £422,298 in '33 and the quantity increased from 425,436,000 lbs. to 431,245,000 lbs. The U. S. is the principal source of England's carbon black imports, supplying 404,766,000 lbs., valued at £515,767, in '34 compared with 400,368,000 lbs., valued at £385,969, during the preceding year.

Customs and Tariffs

¶*New Customs Ruling on Chemical Containers Announced—*

Quicksilver flasks or bottles and metal drums, including those used for the shipment of acids or chemicals, are to be entered hereafter under claims of duty exemption in accordance with amended customs regulations providing for those either of domestic manufacture, or of foreign origin, if the latter actually have been exported previously from the U. S. and used at that time or upon re-importation as the containers of such products. If evidence of exportation or the non-payment of drawback can not be furnished with respect to drums a duty will be imposed of 24c each.

Companies

¶*Monsanto and Swann Stockholders to Vote on Merger of Swann Into Monsanto—*

Board of Directors of both The Swann Corp., in which Monsanto acquired a controlling interest in '33, and Monsanto Chemical approved a contract and will recommend to their respective stockholders the merging of Swann into Monsanto.

EDGAR M. QUEENY

Monsanto president suggests advisability of closer affiliation of Swann to Monsanto

If ratified the stockholders of Swann will receive one share of Monsanto common for each 4½ shares of Swann common.

Swann Corp. has headquarters in Birmingham and a plant in Anniston, Ala. A Swann subsidiary corporation, Provident Chemical, has a plant in St. Louis, for the manufacture of monocalcium and disodium phosphate; another subsidiary, Wilckes, Martin, Wilckes, has a plant at Camden, N. J., where lamp black, bone ash and phosphate salts are produced. The Anniston operations are electrochemical and produce phosphoric acid and its derivatives, calcium carbide, ferro phosphorus, and abrasives.

Edgar M. Queeny, Monsanto president, states that as the operations of Swann are non-competitive with Monsanto acquisition increases the diversity of Monsanto's income and provides new avenues for developments in the electrochemical field.

Swann has gross assets of about $5,500,000 and a capitalization of 508,000 shares of no par common stock, and $704,000 of subsidiary 6% preferred stock. Net earnings of Swann for '34 were approximately $396,000. Absorption will give Monsanto gross assets in excess of $32,000,000 and after the consummation of the transaction, Monsanto will have approximately 965,000 shares outstanding.

Du Pont Argentine Expansion

Du Pont announces intention of further expansion of their activities in Argentina. With their associates in Argentina and a French group, represented by the Comptoir des Textiles Artificielles, a new company will be formed, to be known as "Ducilo" S. A. Productora de Rayon, which will engage in the manufacture and sale of viscose rayon. Construction will shortly be started of a thoroughly modern plant to be located near Buenos Aires. There is at present no rayon manufactured in Argentina, the entire requirements being imported, chiefly from Europe. Approximately 1,000 employes will be required when the plant gets into full operation.

Compensation Plans

C. E. Adams, president, Air Reduction, informs stockholders that the board of directors has approved an incentive compensation plan for '35 under which additional compensation, if earned, may be paid groups of officers and employes entirely in cash. In years prior to '31 plans were based largely on stock.

Stockholders are to vote on the plan at the annual meeting on April 10. At that time, also, they are to pass upon a retirement income plan for the benefit of officers and employes.

Carbide's Stockholders to Vote

Carbide stockholders will vote on Apr. 16 on a proposal to establish a fund for payment of the corporation's share of the cost of a group insurance plan, on a savings plan and on special compensation for officers and employes in key positions.

Subsidiary for United Carbon

United Carbon is forming a new subsidiary, United Carbon, Inc., to take over

company's carbon black plants in Louisiana, Texas, Oklahoma, Utah, and Montana, according to Oscar Nelson, president of the parent company. Plants heretofore had been managed by Kosmos Carbon and Eastern Carbon Black in Texas, and Texas Carbon Industries, in Texas and Oklahoma.

Cyanamid's Saturday Closing

American Cyanamid and American Cyanamid & Chemical announce that, in line with the new general practice in the chemical industry, the N. Y. offices at No. 30 Rockefeller Plaza, will be operated on Saturdays with a skeleton force only, for the handling of emergency orders. This plan will become operative on Saturday, June 1 and extend to Saturday, Sept. 28th inclusive.

Miscellaneous Notes

Monsanto acquires Atlantic Chemical, Billerica, Mass., and will consolidate it with Merrimac subsidiary.

Binney & Smith appoints the O'Brien-Worum Co., St. Paul, Minn., as sales representatives in St. Paul and surrounding territory.

Mathieson will use its Birmingham warehouse, 5 S. 20th st., for distribution of its dry ice to southern points.

Carbide's new $10,000,000 Whiting, Ind., plant went into production on Mar. 14.

"Hydrene" is selected by the fine chemicals division of du Pont to identify its line of softening materials prepared from hydrogenated oils or alcohol.

Plants

¶Niagara Falls Chemical Plants Have Splendid Safety Records—Flaherty, R. & H., Dies

One Niagara Falls company received a bronze plaque, symbolic of a perfect safety record for the longest period in the industry on the Niagara frontier, at a dinner held in Buffalo Mar. 13, and 6 others received 100% certificates for perfect safety records during a 13-week period last fall. National Carbon is the plaque winner and Niagara Smelting and Oldbury Chemical were among the 100 percenters.

Presentations are a result of a campaign carried on by the Associated Industries of N. Y. State to reduce accidents. A total of 19 out of 51 plaques were won by Niagara plants.

Cyanamid's huge Niagara Falls plants are being enclosed by a high wire fence, similar to ones enclosing most of the other industrial chemical plants located in the Fall section.

Inter-State Plant Sold

Henry P. and Gertrude F. Bristol have sold the plant at the southwest corner of Garfield ave. and Marcus st., Jersey City, formerly owned by Inter-State Chemical, to Abraham Goldberg. Plant consists of 4 brick factory buildings on a plot 141 by 158. Property is assessed at $33,000.

Mobile Fertilizer, owned by Walter W. Bolton, is awarded a contract for supplying Alabama relief administration with all of the fertilizer to be used in the rehabilitation program in Mobile county this spring.

Plant Deaths

William Francis Flaherty, for 34 years in the employ of R. & H. at Niagara Falls, recently from an attack of pneumonia. For several years he served as purchasing agent and assistant plant manager. Mr. Flaherty was one of the most prominent residents of Niagara Falls and was identified with numerous social and business connections.

Lawrence Murphy, 81, a retired employee of Dow, on Mar. 8.

Personnel

¶Burnett Now President of American Oil & Supply — Du Pont Elects McCoy a Director—

Curtis R. Burnett, well-known figure in the distributing circles in the Metropolitan area through a connection of 40 years with American Oil & Supply, Newark, N. J., is now president of that company. Mr. Burnett's constructive services to the industry are thoroughly appreciated. He has given freely of his time and energy to all movements that were designed to raise the standards of business ethics; to improve the status of the chemical distributer; to foster the general welfare of the chemical industry as a whole. His customers and competitors alike, when asked to comment on Mr. Burnett's outstanding characteristic, are in perfect agreement on the one word—integrity.

CURTIS R. BURNETT

Years of constructive work are rewarded with the presidency of the company

McCoy—du Pont Director

John W. McCoy, general manager, du Pont's explosives department, is elected a member of the company's board of directors, and has also been made a vice president and member of the executive committee. Edward B. Yancey becomes general manager.

Mr. McCoy has been connected with the company since '02 when he joined it as a chemist in the Repauno plant of the high explosives department. Since that time he has served continuously in a number of the company's plants in various parts of the country, in addition to making a tour of duty in Mexico. He has served as general manager of the department since August, '29. Mr. Yancey joined du Pont as a chemist 27 years ago and has been continuously identified with the explosives department during that entire time. In '28 he became assistant director of the manufacturing division and a year later became assistant general manager, which position he has continued to hold until his appointment to the general managership.

Dodd Opens Service

Bruce C. Dodd, former Eastern division manager, Anderson, Pritchard Oil, opens a technical consulting service on industrial petroleum naphthas at Akron.

Broadwell Goes to Cleveland

Bartley E. Broadwell, Niagara Falls works manager for Republic Carbon, goes to National Carbon at Cleveland as a consultant.

Battelle Appointments

Carlos M. Heath, formerly with American Brass, and C. T. Greenidge, formerly with A. O. Smith Corp., are recent additions to the Battelle Memorial Institute staff. Myron R. Nestor and Philip C. Rosenthal are also new apopintments. In another press announcement, the Institute reports the acquisition of Dr. Bruce A. Rogers, formerly of the Bureau of Standards.

Personal

¶Douglas Attacks Spending Policies of the Administration — Lammot du Pont Talks on Exports—Derby Before Philadelphia Chemical Club—

Lewis W. Douglas, former Director of the Federal Budget, now a Cyanamid director, criticizing the "spending policies" of the present administration, warned of a "destroyed currency" and of the possibility of a "complete change in our political organization."

"Only a dictator—whether it be a dictator of Socialism or of Fascism is unimportant—will be adequate to cope with the

situation," he told students of the Wharton School of Finance and Commerce, recently.

"If the emergency in the spring of '33 was sufficient to vest in the Executive greater powers than ever before in our history have been vested in him," he said, "is there any reason to doubt that the sheer weight of economic forces, quite irrespective of desire or intent, will force a complete change in our political organization?"

According to the *Wall Street Journal*, the Philadelphia charges of Mr. Douglas that the Roosevelt Administration has "shot out all the red lights" nearly drew an official reply, but after a brief flurry among officials most directly concerned the idea was vetoed.

Leading Talks of the Month

Lammot du Pont speaks before the Export Managers' Club on Mar. 19, at the Pennsylvania, in N. Y. City on the subject of exporting from the manufacturer's viewpoint.

H. L. Derby, president, American Cyanamid & Chemical, is the guest speaker of the Chemical Club of Philadelphia at the April meeting.

Mr. Derby has accepted an honorary membership in the Salesmen's Association of the American Chemical Industry.

Nobel Prize Winners

America's 2 living Nobel Prize winners in chemistry, G. E.'s Dr. Irving Langmuir and Columbia's Prof. Harold C. Urey, will be the guests of honor at a dinner, Apr. 22, one of the opening events of the Tercentenary celebration. Dinner will be given by the Society's Division of Physical and Inorganic Chemistry, with Prof. Victor K. La Mer, Columbia, presiding.

Tone, Acheson Medalist

Frank J. Tone, president of Carborundum is awarded the Edward Goodrich Acheson International medal and a prize of $1,000 by the Electrochemical Society, for outstanding work in electrochemistry.

Heard Here and There

Dr. and Mrs. Charles M. A. Stine and their daughter, Miss Barbara Stine, return from Florida Mar. 18. Dr. Stine heads du Pont's research activities.

Godfrey L. Cabot, carbon black manufacturer, has been elected honorary president of the Massachusetts Chess Club, Boston, Mass.

Munston Burton, connected with Swan-Finch for many years, is retiring from active work.

Mrs. E. H. Haines, chairman of the board of E. H. Haines Distributing Co., well-known Chicago paint raw materials distributor, is in Mexico.

"On the Gangplank"

Cyanamid's Whitaker sails in the *Ile de France* on Mar. 23.

William ("Bill") Mueller, Commercial Solvents' sales manager, also sails in the *Ile de France* for a month's visit in England and on the continent.

Robert ("Bob") Wishnick, president, Wishnick-Tumpeer, returns in the *Rex* on Mar. 19.

"Vic" Williams, Monsanto, goes to Bermuda in the *Queen of Bermuda* on Mar. 23.

Associations

¶*Pitcher Speaks on Plastics Before N. Y. "P. A.'s"—Critchett New Electrochemical Society Head—*

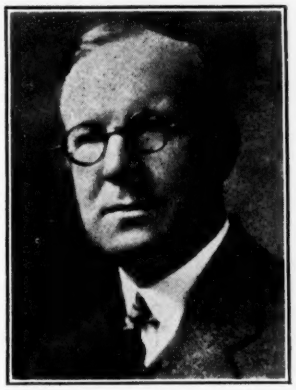
Du Pont Viscoloid's president, Arnold E. Pitcher, is the guest speaker of the Purchasing Agents Association of N. Y., speaking on "Modern Plastics As the 'P. A.' Should Know Them."

DU PONT VISCOLOID'S PITCHER

He reviews the development of plastics in this country.

New York will be the headquarters for purchasing executives from all parts of the U. S. and Canada when the 20th Annual International Convention and Inform-a-Show of the National Association of Purchasing Agents meets at the Waldorf, May 20-23, inclusive.

"The Effect of National and International Governmental Policies on Commodity Prices" is the theme for the general program, with special sessions devoted to discussing their effect on purchasing practice and procedure, and specific commodities such as non-ferrous metals; paper, pulp and board; edible oils; heavy chemicals; foodstuffs; ferrous metals; textiles; lumber; coal, and mineral oils. The Inform-a-Show, an industrial exhibit of products and processes will include displays by representative companies.



CARBIDE'S CRITCHETT

His outstanding contributions in the electrochemical field bring the presidency of the Electrochemical Society for '35.

1500 At Section Dinner

Senator "Huey" Long and the Townsend plan ($200 a month for everyone over 60) were the objects of a bitter attack made by Senator Joseph T. Robinson, majority leader of the Senate, at the annual dinner of the Drug, Chemical and Allied Sections of the N. Y. Board of Trade at the Waldorf-Astoria on Mar. 21. Terming the "share the wealth plan" of Long and the Townsend plan as "gilded gateways to an economic paradise," the speaker assailed both men for espousing unworkable and impracticable ideas and likened both suggestions to the "gold at the rainbow's end."

Over 1,500 attended the affair, the largest in the history of the dinners. Robert L. Lund, vice-president, Lambert Pharmacal, acted as toastmaster.

Moore Re-Elected

Robert J. Moore, Bakelite, is re-elected chairman for '35-'36 of the American Section of the Society of Chemical Industry. Other officers elected are: W. D. Turner, Columbia, vice-chairman; Foster Dee Snell, Foster Dee Snell, Inc., secretary; J. W. H. Randall, consultant, treasurer.

New members of the executive committee are: Wm. H. Gesell, Lehn & Fink; Elmer K. Bolton, du Pont; I. B. Rather, Socony-Vacuum; E. R. Weidlein, Mellon. These new appointments are in addition to the following other members of the executive committee who remain in office: A. E. Marshall, consultant; Gustav Egloff, Universal Oil Products; Charles A. Lunn, Consolidated Gas; J. G. Detwiler, Texas Co.; Lincoln T. Work, Columbia; James G. Vail, Philadelphia Quartz; Wallace P. Cohoe, consultant; and Arthur D. Little.

Olson on Distillation

E. T. Olson, manager of Cleveland Cliffs' Marquette operations, speaks before the Midland A. C. S. section on "Hardwood Logs and Chemicals."

Meetings During A.C.S. Week

Cornell chemists will hold a group luncheon on Apr. 24 during the tercentenary celebration of the A. C. S. Luncheon will be held at one of the convention hotels and tickets will be available at convention booths. Brooklyn Poly chemists will meet at luncheon on Tuesday, Apr. 23. The American Institute of Chemists will hold a luncheon at the Martinique on Apr. 25.

Chemists' Club Nominations

Chemists' Club (N. Y.) through its nominating committee places the following slate before the members: president, Martin H. Ittner; resident vice-president, Arthur W. Hixson; non-resident vice-president, Victor G. Bloede; suburban vice-president, John Johnston; secretary, Robert T. Baldwin; treasurer, S. J. White; trustees, 3-year term, Clarke E. Davis and Sidney D. Kirkpatrick.

Litigation

¶Alkyd Resin Patent Suit Heard in Brooklyn. Decision Expected in May—V.-C. Directors File Petition Against Dividend Ruling—

Important alkyd resin patent suit brought by G. E. against Parament Chemical was heard last month before Federal Judge Campbell, sitting in the Federal Court for the Eastern district of N. Y., Brooklyn, N. Y. An imposing array of legal and technical talent appeared for both sides, arguing over alleged infringement of the Kienle patent (No. 1,893,873). Cyanamid, du Pont and Carleton Ellis associated themselves with G. E. in the suit. Final decision is not expected before late May or early June.

Resist $7 Dividend Payment

Four V.-C. directors file, through counsel, a petition for a writ of error in the case in which Judge E. H. Wells recently ordered the company to pay $7 in back dividends on its prior preference stock. Petition seeks a reversal of the ruling. Petitioners are M. B. Staring, G. E. Warren, Harry Bronner and Alfred Levinger, all of N. Y. See C. I., March, p273. Last month it was reported that the ruling would not be contested.

Davison Receivers Winners

In a decision just handed down in U. S. District Court, Eastern Transportation Co. is held liable for the loss of a cargo of phosphate rock shipped by barge from Baltimore to Norfolk in January, '34, by the receivers of Davison Chemical.

Sulfur Suit Dismissed

Sulfur royalty suit against Jefferson Lake Oil is dismissed by Federal Judge Borah sitting in New Orleans.

Moves

William Neuberg, chemical dealer, is now at 441 Lexington ave., N. Y. City, the first move in nearly 20 years.

Publicker Commercial Alcohol, moves its N. Y. City office to 525 W. 43 st., from 230 Park ave. Telephone of the new office is Bryant 9-8440.

Washington

¶Richberg Names Codes He Would Drop in Re-Organized NRA—Other NRA News—Wood Distillers Protest—

Donald R. Richberg, executive director of the National Emergency Council, appearing before the Senate Finance Committee last month, suggested the elimination of 286 codes that in his opinion should be dropped. Those connected with or allied to chemical industry which he suggested to be dropped are listed below as follows:

Alloy industry.
Aluminum.
Asbestos.
Ball clay production.
China clay products.
Coated abrasives.
Earthenware manufacturing.
Feldspar.
Fullers earth producers and marketers.
Gypsum.
Lime.
Manganese.
Mica.
Nickel and nickel alloys.
Preformed plastic products.
Quicksilver.
Refractories.
Talc and soapstone.
Industrial safety equipment, ind. and trade.
Metal tank.
Packaging machinery.
Petroleum equipments.
Spray painting and finishing equipment manufacturing.
Electrotyping.
Photo-engraving.
Adhesives and ink.
Animal glue.
Automotive chemical.
Specialties manufacturing.
Bleached shellac.
Candle manufacturing and beeswax and bleachers refiners.
Carbon black.
Dry color.
Fiber can and tube.
Hardwood distillation.
Insecticide and disinfectant.
Lye.
Natural organic products.
Container.
Oxy-acetylene.
Pharmaceutical and biological.
Printing ink.
Pyrotechnic.
Reclaimed rubber.
Salt producing.
Shoe and leather finish polish and cement.
Sulphonated oil.
Tanning extract.
Waterproofing, damp proofing, caulking compounds and concrete floor treatment.
Rug chemical processing trade.

NRA

¶Automotive Chemical Specialties Manufacturing Industry Code Authority Suggests Amendments

NRA scheduled on Mar. 12 a public hearing for Apr. 1, '35 on a proposed amendment submitted by the Code Authority for the automotive chemical specialties manufacturing industry. Proposed amendment would strengthen the present provision prohibiting the use of prizes, premiums or gift, in connection with the sale of products. It would prohibit the granting of any "bonus, commission, premium prize, free goods, or other saleable merchandise or any article of value to any wholesaler or retailer and/or any salesmen or employee of any wholesaler or retailer."

Provision would not, however, prevent the giving or selling to a customer (wholesaler or retailer) any display case or any other advertising equipment designed to assist the customer (wholesaler or retailer) in making sales. Neither would it be applicable to any "consuming firm, partnership or corporation."

Code Authority for the automotive chemical specialties manufacturing industry petitions NRA for termination of the exemption conferred by Administrative Order X-36, under which members of an industry were relieved from contributing to the support of a code other than the one which covered their major line of business. The hearing on the petition was scheduled for Apr. 6, before Deputy Administrator Earle W. Dahlberg.

Other NRA Notes

NRA approves the zinc industry code. It became effective Apr. 8.

Office of Maj. O. E. Roberts, Jr., deputy administrator in charge of the chemical section of the National Recovery Administration, has been removed from the Department of Commerce Building to the Denrike Building at 1010 Vermont ave., N. W., Washington, D. C.

P. & G. is accused with a violation of Section 7-A at the Long Beach, Calif., plant by the National Labor Relations Board.

Propose $50,000 Loan Limit

A veritable boon to investment property owners throughout the country is promised if Congress should act favorably on suggestions made by industrial leaders to liberalize the provisions of Title I of the National Housing Act by increasing to $50,000 the limit of modernization loans insured by the FHA.

Import Statistics

U. S. Tariff Commission releases the 1934 report on N. Y. imports of chemicals and medicinals not specially provided for in the Tariff Act of 1930 (Par. 5).

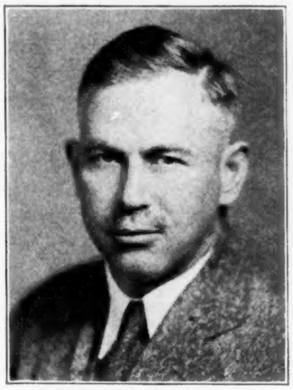
Canadian Tariff Pact

Wood distillers, through Dr. M. H. Haertel of the Wood Chemical Institute, file a protest against any reduction in the tariff on acetic in the proposed trade pact with Canada.

Equipment

¶Hill New Lukens Steel Director of Research — Other Appointments — Sprout-Waldron's New Agent—

Erle G. Hill who joins Lukens Steel, Coatesville, Pa., as director of research, was born in Santa Ana, Calif., in '90 and studied mining and metallurgical engineering at the University of California. After graduation in '13, he took graduate work at the University of California, Carnegie "Tech" and the University of Pittsburgh.



ERLE G. HILL

Brings a technical background of many years to steel problems.

Hill's early work was as a mining engineer and metallurgist in the western states and in Mexico. In 1918, he became an instructor in mining and metallurgy at the Carnegie "Tech," during which time he was also a member of the staff of the Pennsylvania Geological Survey. In 1920, he became an associate professor of metallurgy at the University of Pittsburgh, serving there for 10 years, during which time he also functioned as consultant for various companies in mining and metallurgical fields. He resigned in '30 to accept a research fellowship at Mellon, remaining in that work until he joined Lukens Steel. He is a member of the American Institute of Mining and Metallurgical Engineers, American Society of Metals, American Society of Testing Materials and Franklin Institute.

In New Positions

National Alloy Steel, of Blawnox, Pa., appoints Horace T. Potts Co. of East Erie ave. & D st., Philadelphia, as district representative covering the sale of heat, corrosion and abrasion resisting castings in Philadelphia and Baltimore territories. The Potts Company was established in 1815.

W. A. Hauck is appointed assistant to the president of Lukens Steel Company, Coatesville, Pa.

Ernest E. Lee Co., 53 W. Jackson Boulevard, Chicago, is appointed by Coppus Engineering Corp., Worcester, Mass., to handle air filters for air compressors, internal combustion engines, industrial and ventilating applications.

W. F. Gradolph is now a vice-president of The Devilbiss Co.

Alsop Engineering appoints W. H. Lilly Ohio representative, with offices at 1903 Berkley ave., Cincinnati.

Wm. M. Gross is appointed district sales manager in Ohio and eastern Michigan for International Filter, with headquarters at The Westlake, Cleveland, Ohio. He was formerly manager of the Water Treating Division of Graver Tank and Manufacturing.

Conite Engineering Appointed

Sprout, Waldron and Co., Muncy, Pa. (crushing, grinding, sifting, mixing, elevating, conveying and power transmission machinery), appoints Conite Engineering and Sales Co., Nashville, Tenn., as sales agents for Tennessee, parts of Kentucky and Alabama.

Construction

¶Link-Belt Gets Titanium Pigment's Order — Carbide's New Plant Starts—

Titanium Pigment awards Link-Belt a substantial contract for bucket elevators, screw conveyor, and ribbon conveyor, for handling paint pigments in process.

Southeastern Construction is building an addition to Sandoz Chemical's building at Charlotte, N. C.

Carbide's Charleston plant will be enlarged in '35.

Rumor has it that a large chemical concern will take over Tubize's Hopewell rayon plant. Machinery of the latter is being moved to Sao Paulo, Brazil.

Foundation work has started on the chemistry building at Washington State at Spokane.

New Incorporations

Olson Preservative & Paint Corp., Newark, N. J.

The Wood Preserving Corp., Montpelier, Vt., with a $20,000,000 capitalization to manufacture, treat chemically and sell forest products.

Lane Laboratories, Inc., is a new Camden, N. J., firm making "Silverene"—a new silver polish.

Clenol, Inc., 120 Michigan st., Toledo, chemical cleaning compounds.

Mayesville Mixing, Columbia, S. C., R. J. Mayes, Jr., president and treasurer.

Fine Chemicals

¶Alcohol is Advanced 1½c — Tartrates Continue Weak — Epsom Salts Reduced—

Outstanding development in the fine chemical field was the advance of 1½c a gal. in denatured and ethyl alcohol, placed in effect on Apr. 1. The tartrates continued to develop further weakness, Rochelle salt being off a ½c per lb. and Seidlitz Mixture, ⅜c per lb. No change, however, was made in the quotations for tartaric acid. Calomel and corrosive sublimate prices are still very competitive. Accompanying the change in technical Epsom salt, the U.S.P. article was reduced 25c per 100 lbs. to the basis of $2.00. Zinc stearate is up a cent, an advance that has been forecast for several weeks because of the strength in the stearic acid market. A particularly firm market has been developing in adeps lanae. Silver nitrate is up sharply from the close in February, due, of course, to the strengthening in the silver quotations.

Important Price Changes

	Mar. 30	Feb. 28
ADVANCED		
Adeps Lanae, Anhyd	$0.17	$0.16
Hydrous	.16	.15
Alcohol, ethyl	1½c per gal. advance	
Silver nitrate	.42¼	.39⅜
Zinc stearate, U. S. P.	.20	.19
DECLINED		
Calomel	$1.01	$1.05
Epsom salt, U. S. P.	2.00	2.25
Rochelle Salt, cryst.	.14	.14½
Powd.	.13	.13½
Seidlitz Mixture	.11⅛	.11½

Seasonal items are showing signs of picking up and citric acid shipments are in better volume. The price situation in this item is one of firmness. The European monetary uncertainty is giving importers of various crude and finished items cause for worry, but as yet, this condition has affected prices here but very little.

Chemistry—A Career

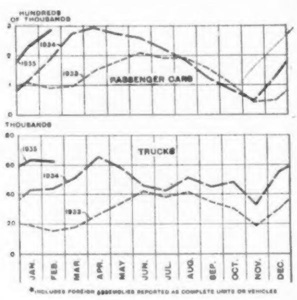
"The Deserted Village," No. 5, is the title of a booklet being distributed by the Chemical Foundation, 654 Madison ave., N. Y. City, to the youth of the country. It contains an illuminating article, "Chemistry in the Service of Science," by Dr. A. T. Lincoln of Carleton College, Northfield, Minn., the story of chemistry's contribution to the growth and welfare of the U. S.

"To the Youth of America—We need more good and great chemists . . . a career awaits you," said the head of the Foundation, Francis P. Garvan, recently. A free copy is available from the Foundation offices by mentioning CHEMICAL INDUSTRIES.

Heavy Chemicals

¶March Shipments are Disappointing — Sulfur Statistics for '34 Summarized—

With the possibility of strikes in several of the larger chemical consuming industries, the flow of shipments in March was somewhat irregular. While the volume in the first 10 days was quite satisfactory a distinct tapering off was reported in the last half of the month.



—Bureau of the Census
Automotive Production

Activity in the textile field continues to slacken, particularly in the cotton division. Dyeing and finishing operations are curtailed in the Northern New Jersey and New England sections, but are slightly improved in the South. There is a threat of a strike in the cotton cloth division.

The tire center about Akron is also threatened with labor troubles and there is talk of a concerted effort between the labor unions in the automotive and rubber fields. In the meantime, however, both Detroit and Akron are operating at feverish rates and automotive production in the last week of the month reached over 100,000 units for the first time in nearly 5 years.

2nd Quarter Prices

With the close of the first quarter and the period at hand for reviewing contract prices on a number of items, very few changes require reporting. Anhydrous sodium sulfate price in barrels has been "upped" 5c per 100 lbs. to \$1.30-\$1.55, while the bag quotation remains at \$1.15 to \$1.40. After a long period of stability the price of Epsom salts has been reduced 25c per 100 lbs. The rise in antimony oxide was due to higher replacement costs.

Despite the slowness in ordering out shipments and the rather pessimistic feeling prevailing during the greater part of the 30 day period an improved tone was discernible in the last few days of March and producers are now more hopeful of April. The glass, ceramics, paper tanning and paint fields are expanding slowly. There is plenty of grounds to expect that the automotive and rubber industries will remain very active at least for another month. Seasonal items, such as calcium chloride and the arsenicals, are moving out in satisfactory quantities. The price situation on the latter is decidedly firmer.

Important Price Changes

	Mar. 30	Feb. 28
ADVANCED		
Antimony oxide	\$0.11¼	\$0.10¾
Sodium sulfate, anhyd.	1.30	1.25
DECLINED		
Epsom salt, tech.	\$1.80	\$2.05
Sodium stannate	.31½	.32
Sodium silicofluoride	.04¼	.04½
Tin oxide	.51	.52

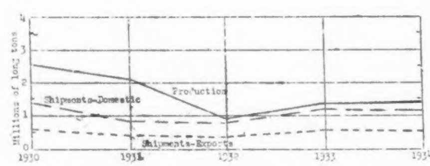
Sulfur in '34

Sulfur production and shipments changed little in '34 in comparison with '33. Production increased slightly, from 1,406,063 long tons in '33 to 1,421,473 tons in '34. Shipments declined from 1,637,368 tons in '33, valued at about \$29,500,000, to 1,613,838 tons in '34, valued at about \$28,900,000. Production of sulfur was reported from California, Louisiana, and Texas.

Production of sulfur in Louisiana decreased from 321,492 long tons in '33 to 229,830 tons in '34. Shipments, however, increased from 128,916 tons in '33 to 307,186 tons in '34. As in '33, Freeport Sulphur Co. and the Jefferson Lake Oil Co., Inc., were the producers.

California produced 4,410 long tons of sulfur in '34. Bureau of Mines is not at liberty to publish comparable figures for '33, but the combined production for California and Utah totaled 1,126 tons.

Average quoted price for sulfur as reported by the trade journals was unchanged at \$18 a ton, f.o.b. mines, throughout the year. The spot price for car lots was \$21 a ton.



Little change is reported in the sulfur industry in the last year

Imports of 5,839 long tons of sulfur ore were recorded by the Bureau of Foreign and Domestic Commerce in '34. This quantity compares with 4,773 long tons in '33. Chile supplied all sulfur received in the U. S. in '33 and in '34.

Exports of sulfur or brimstone in '34 totaled 503,312 long tons compared with 522,515 tons in '33, a decrease of 4%. Important quantities of American sulfur were exported to the following countries in '34: Canada received 145,384 tons in '34 compared with 122,954 tons in '33; France, 71,829 tons, compared with 84,093 tons; United Kingdom, 62,434 tons, compared with 47,149 tons; Australia, 44,819 tons, compared with 37,726 tons; Germany, 38,819 tons, compared with 69,139 tons; and Sweden, 30,963 tons, compared with 20,578 tons. Shipments from the U. S. to the United Kingdom in '34 were the largest ever recorded. Shipments to Sweden in '34, were the largest recorded since '22, when 41,325 long tons were exported to that country. Exports of crushed, ground, refined, sublimed, and flowers of sulfur in '34 were 22,660,890 lbs., an increase over the 19,629,405 lbs. exported in '33. Principal importing countries were Canada with 5,595,548 lbs.; Australia, 2,415,621 lbs.; United Kingdom, 1,952,313 lbs.; Mexico, 1,803,998 lbs.; Germany, 1,621,488 lbs.; Canary Islands, 1,414,715 lbs.; and Brazil, 1,299,912 lbs.

Chemical Specialties

Because of the importance to car owners of putting tops of their automobiles in condition after the hardship of winter G. W. Sherin, du Pont chemical specialties expert, has just completed a bulletin on the subject.

Effective April 1, P. & G. advanced the pay of all factory employees paid on an hourly basis 5¢ an hour. Plant employes engaged in production who are on a weekly basis will be given a wage increase of \$2 a week. The advance affects about 7,500 workers.

Gold Star Ski Wax is a new product made by Northland Ski Mfg. Co., St. Paul, Minn.

Chroma, a cleaner and polish for Chromium, is being made by the D & R Mfg. Co., Inc., Niagara Falls, N. Y.

FlyDed Insect Powder, in a handy spray container, is being advertised by the Midway Chemical Co., Chicago.

Trade Commission

False and misleading representations in violation of Section 5 of the F.T.C. Act is charged against Electric Paint & Varnish of Cleveland, in a complaint just issued against that concern by the F.T.C.

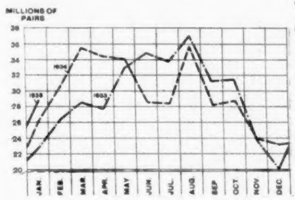
Barging Cottonseed

P. & G. is establishing experimental river-rail service on cottonseed oil between Memphis and Cincinnati. Oil is barged up the Mississippi from Memphis and transferred to tankcars at Cincinnati and forwarded to Ivorydale. About 600 tons a week are being moved in this fashion and plan may be extended to other crushing centers.

Textile and Tanning Chemicals

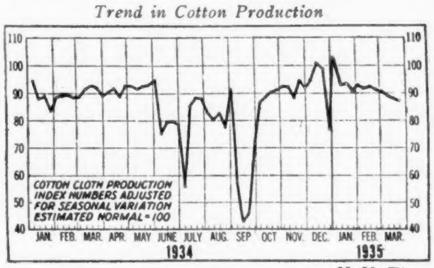
¶*Textile Operations at Unsatisfactory Levels — Dextrine and Starch Quotations are Lower—*

Call for textile and tanning chemicals was of a very routine nature last month. The uncertainty surrounding the textile field was in evidence in the purchasing of finishing chemicals and dyes. Cotton cloth production declined sharply again in March, following a net loss in February and the outlook is for further curtailment in the next 60 days. Silk and rayon are showing up better, particularly the former, although



—Bureau of the Census
Shoe Production

Trend in Cotton Production



—N. Y. Times

producers are dissatisfied with the current price structure. Wool consumption has been fair but the immediate outlook is not an encouraging one. Despite this immediate pessimism which has gripped the textile field, the consensus of opinion is that further improvement may be looked for, at least in rayon and silk and that the half yearly production totals will come close to the corresponding figures for the first half of '34.

Tanning centers are extending operations slightly and preliminary estimates of March shoe production indicate some betterment over February. The rate of activity in both lines is satisfactory. Production of shoes and boots in January totaled 38,833,620 pairs. December total was 23,199,708 pairs and in January, '34, total production was 26,041,782 pairs.

The decline in the commodity markets, including corn, resulted in a downward revision in the schedule of prices for both starch, dextrin and corn sugar. Slight advances were reported in several of the tanstuffs including Cutch, Philippine; Mangrove Bark, Valonia Beards and Wattle Bark. A fairly good demand was reported by the bichromate producers. Aluminum chloride is moving out in satisfactory volume. Stocks of egg yolk are reported at a very low point as buyers

Important Price Changes

ADVANCED	Mar. 30	Feb. 28
Cutch, Philippine	\$ 0.03¾	\$ 0.03¼
Mangrove Bark	29.50	29.00
Valonia Beard	43.00	42.50
Wattle Bark	30.00	29.25
DECLINED		
Corn Sugar, tanners	\$ 3.46	\$ 3.56
Dextrin, corn	3.95	4.05
British gum	4.20	4.30
White	3.90	4.00
Myrabalans, J1	23.50	24.00
Starch, pearl	3.36	3.46
Powd.	3.46	3.56
Potato, dom.	.04½	.05½
Imp.	.05¾	.06¾

hastened to take up deliveries in fear of the proposed licensing tax.

Du Pont Reviews "Vat Dyes"

Increasing demand for fast colors, commonly known as "vat dyes," is reported by du Pont's Dyestuff's Division. Company attributes increase to improvement in economic conditions and a growing desire for fast colors on the part of the consumer.

Demand for fast dyes suffered in the depression just as did other commodities. There was a steady decline during the latter part of '29 and the years immediately following up to the middle of '33, peak being reached in July of that year, immediately preceding the going into effect of the Textile Code.

Increased demand continued through '33 and '34, latter showing a substantial gain over the previous year. Demand has held up consistently and has carried over into the present year, with prospects of the first 6 months of this year showing a greater demand than for the same period last year.

Seasonal Color Cards

A glove color card will be issued for each Spring and Fall season by the Textile Color Card Association, it was unanimously decided at a meeting of the color organization's members in the glove industry.

Nine new colors are featured in the 1935 Spring Season Hosiery Card just released by the Textile Color Card Association to its members.

New Textile Specialties

Reliance Chemical Products, with a plant in East Providence and offices in Providence and N. Y. City, has just brought out 2 new solvents for the textile industry, Duolene and Lyol.

Chamberlin with Warwick

Dr. Dale S. Chamberlin, formerly technical director of the R. K. Laros Silk Co., Bethlehem, Pa., is now on the sales staff of Warwick Chemical, West Warwick, R. I.

Solvents

¶*Alcohol Prices Higher — Some Petroleum Solvents Tankwagon Prices are Reduced—*

Interest in the solvent field last month was divided between the increases in completely denatured and special denatured alcohols, the renewal of contracts for

Important Price Changes

ADVANCED	Mar. 30 Feb. 28
Alcohol, most grades	1½c a gal. advance
DECLINED	
None.	

most of the lacquer solvents for the 2nd quarter at unchanged price levels, the readjustment of tankwagon prices on a number of the petroleum solvents and thinners in various key cities and the rise in solvent naphtha and xylol. The 2 latter items are reported in the Coal Tar Chemicals section.

The new schedule on alcohol became effective Apr. 1. Carryover on anti-freeze is reported to be of very modest proportions and with the call for industrial purposes at a very high level, the price structure is firm.

The lowering of tankwagon prices in the petroleum solvent field was restricted to parts of the Middle West and far West. One reduction was noted at Rochester, N. Y. Quotations from Eastern refineries remain unchanged and the tankcar price structure is unaltered.

First Quarter Deliveries

Delivery of solvents in the first quarter has been in very satisfactory volume and the total is far in advance of earlier expectations. The sustained activity in the automotive centers, together with the rush in the tire sections continued through March bringing the production of cars up to a million units with the attending boost in original tire equipment to over 5 million. There is now talk in Detroit of another million units in the 2nd quarter.

The principal changes in the petroleum tankwagon prices as reported are shown as follows. The current quotation is given and in brackets the amount of the recent decline.

	Cleaners' Naphthas	Petroleum Thinners	Stoddard Solvent	V.M.&P. Naphthas
Chicago	15c(3c)	15.7c(1c)	15c(3c)	16c(2c)
Decatur	20.4c(.2c)	19.1c(.2c)	......	20.6c(.2c)
Rochester	....	14c(3c)	......	....

New Costs Bulletin

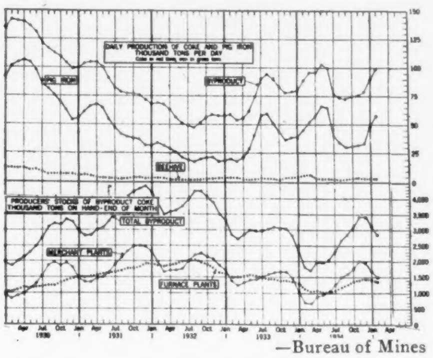
Under date of Mar. 18, the Paint Industry Recovery Board has issued a Market Replacement Costs Bulletin to members of the industry.

Coal Tar Chemicals

¶Coke Operations Expanded in February—Xylol Scarce and 4c Higher — Coal Tar Resins in Germany—

For 5 successive months coke production has shown an advance over the preceding month. Total output of byproduct and beehive coke for February amounted to 2,873,432 tons, or 103,175 tons per working day, highest daily rate recorded since May, '34. In comparison with January, February rate increased 10.2%. Gain was a direct reflection of improved activities in iron and steel, where the daily rate of pig iron output increased 20.5% during the same period.

Trend in Coking Operations



—Bureau of Mines

Output of byproduct coke for the 28 days of February was 2,780,632 tons, or 99,308 tons per day. Compared with January the rate increased 9.9%. Practically all of the increase occurred at furnace plants, where the daily average of 67,665 tons was 15.1% higher than that of the preceding month. At merchant plants rate advanced only 0.1%. Production of beehive increased during the month, average daily production of 3,867 tons being 18.7% above that of January.

Stock piles at byproduct plants decreased 8.6%, from 3,129,278 to 2,860,186 tons, lowest level reached since September, '34. Bulk of the decrease occurred at merchant plants.

Important Price Advances

Several important price advances were registered in the past 30 days, including 4c rises in xylol and solvent naphtha. Scarcity of stocks in each instance, caused by a very heavy demand, is the reason assigned for the revision in schedules. The rather irregular situation in benzol continues, but 2nd quarter contracts are being written at present prices. Creosote oil is firm. Price advances were announced for the various grades of carbazole, dinitrotoluene oily and orthonitrotoluene. The seasonal expansion in demand for naphthalene made its appearance late in the month and shipments are now in good volume. Likewise, there has been a noticeable improvement in the call for the disinfectant tar oils. An expansion in the shipments of phenol to the synthetic resin field is reported.

Movement of intermediates was somewhat slower in the past month than in February. Dye sales were also down somewhat from the February totals as the activity in the textile industry continued to lag, but the price structure remains firm.

Important Price Changes

ADVANCED

	Mar. 30	Feb. 28
Carbazole 90%	$0.80	$0.55
98½-99%	.92	.70
Dinitrotoluene, oily	.08½	.06½
Orthonitrotoluene	.07	.05½
Solvent naphtha, tks.	.30	.26
drs.	.35	.31
Xylol, com., tks.	.30	.26
drs.	.35	.31

DECLINED
None.

Resins in Germany

Production of synthetic resins from coal tar in Germany has made steady progress recently according to a report from Consul Sydney B. Redecker, Frankfort-on-Main, made public by the Commerce Department's Chemical Division.

Commenting on the report from Germany C. C. Concannon, Chief of the Commerce Department's Chemical Division pointed out that the production of synthetic resins from coal tar is receiving serious attention in all industrial nations and particularly in the U. S., which today leads in the chemistry of synthetic resins and their application. Official statistics show that production of synthetic resins from coal tar in the U. S. totaled 41,628,500 lbs. in '33 compared with only 1,500,000 lbs. in '21. Approximately three-fourths of the '33 production was sold in consuming channels for a total of $7,238,600, the remainder being consumed within the industry.

February Imports

U. S. Treasury February imports of synthetic dyes showed a decline from the preceding month of 94,597 lbs. in quantity, and a decrease in value of $177,729, total figure for February being 342,998 lbs., against 437,595 for the preceding month, with a value of $513,580, against $691,309. February imports of this year showed a gain of a little more than 2% over the poundage for the same month a year ago, and a gain in value of more than 8%.

Imports of synthetic aromatic chemicals dropped below those of the preceding month, with a loss of about 39%, and a drop in value of more than 38%. Total poundage was more than 70% below that for the month of February a year ago, and the value 57% below.

Toxicity of Vapors

Scientific Section laboratories of the National Paint, Varnish and Lacquer Association have been conducting a brief research of the literature relating to the relative toxicity of vapors from benzol, toluol and xylol. Upon request, the Scientific Section will forward to any member of the Association interested in this subject, a brief résumé of their researches. Address, 2201 N. Y. ave., N.W., Washington, D. C.

Manchurian Soybean Oil

Manchurian exports of soybean oil have been declining steadily in recent years and in '33-'34 amounted to only 72,000 short tons, lowest in 15 years. Chinese and European markets usually take practically all of the shipments. Purchases by China last season, however, were very low, amounting to only 18,000 short tons or 25% of the total while Europe, after several years of declining imports, took 53,000 short tons or 73% of the total. Europe has found it profitable since the war to crush her own soybeans and for that reason has been reducing her imports of Manchurian oil and oil cake. U. S. in '33-'34 took only 760 short tons of Manchurian soybean oil compared with 2,000 short tons in '32-'33. Darien crushers expect an increased demand for oil from both the U. S. and Europe during '34-'35, says Rossiter.

The 1934-35 export surplus of soybeans in Manchuria, world's largest producer and exporter of this product, has been officially estimated at 3,065,000 short tons, a reduction of approximately 24%, compared with the '33-'34 surplus, and a reduction of about 31% compared with the average surplus for the past 5 years, according to a report to the Bureau of Agricultural Economics from Assistant Agricultural Commissioner F. J. Rossiter.

Statistics of the Coal Tar Industry

	February 1935	Change from last month	January 1935	February 1934	Year to Date 1935	Year to Date 1934
Coking coal—by prod. oven, tons	4,028,708	—0.7%	4,058,112	3,644,700	8,476,920	7,265,904
Stocks of coke, by-prod. plants..	2,860,186	—8.6	3,129,278	1,807,802	2,860,186	1,807,802
Coke production, by-prod.	2,780,632	—0.7	2,801,552	2,493,494	5,582,184	4,969,279
Benzol production, gals.	6,200,000	+0.3	6,182,000	5,545,000	12,382,000	10,987,000
Light oil production, gals.	11,039,659	....	11,119,226	9,986,478	23,227,760	19,908,576
Tar output, gals.	37,587,845	....	37,862,184	34,005,051	79,089,663	67,790,684
Ammonium sulfate prod., tons ..	42,562	—0.5	42,787	38,343	85,349	76,252

Paints, Lacquers and Varnish

¶Increased Demand for Raw Paint Materials — Construction News Remains Bearish — New Copper Paint—

Important Price Changes

ADVANCED

	Mar. 30	Feb. 28
Lead, red 95%	$0.0615	$0.0605
97%	.0640	.0630
98%	.0665	.0655
Litharge	.0515	.0505
Palmitates, stearates	.1c advance in each case	

DECLINED

Casein, 20-30	$0.12½	$0.13
80-100	.13	.13½
Chrome Yellow	.14	.15

A very decided improvement in the purchasing of raw materals by the paint trade occurred in the past 30 days and the pessimistic feeling of February is giving way to one of conservative optimism. Indications now point to the encouraging fact that sales for the first quarter of '35 were ahead by an appreciable margin over the first quarter statistics for '34.

Red lead and litharge both made price advances in March. The long expected rise in the various stearates finally was placed in effect and the palmitates were given corresponding increases too. The several advances in stearic acid over the last few months gave ample warning of the impending rise in stearates and this feature has been commented upon several times.

Rather surprising was the reduction of a cent per lb. in chrome yellow for the 2nd quarter. This action was unexpected in most quarters and singularly took place on a day in which a rise in pig lead was announced. The change in chrome yellow was the only one in the pigment group to be made as prices for the next 90 days were posted. Casein quotations were off slightly, as stocks became more plentiful. The rise in prices over the last few months has encouraged the importation of Argentine material.

Several important price adjustments were reported in the varnish group. In most cases this was the direct result of the monetary situation in several of the European countries, notably Belgium. The various grades of copal Congo were up sharply as a result of the devaluation of the belgas. Ester gum prices are advanced for the 2nd quarter.

Prices for lacquer solvents are renewed for the next 30 days. The same is true for the chemical dry colors. The revised price schedule for aluminum powder and paste is but very slightly different from the former existing quotations.

Dodge Building Figures

February showed the expected seasonal dip in construction contracts when compared with the reported volume for January. Total reported by F. W. Dodge Corp. was $75,083,500 for the 37 eastern states as against $99,773,900 in January, a decline of about 25%. Contract volume for February, '34, totalling $96,716,300, was only about half as great as the January '34 volume.

For the initial 2 months of '35 construction awards of all descriptions in the area east of the Rocky Mountains totaled $174,857,400 in contrast with $283,180,000 for the corresponding 2 months of '34. A year ago contract-letting under the PWA program was in full swing; currently this influence has largely spent itself.

Contract losses in February as contrasted with totals for the previous month were shown as follows: almost $12 million in public works; almost $6 million in residential building; about $5 million in public utilities; and $2 million in non-residential building types. The $16,616,800 total recorded for residential contracts, however, was about 14% larger than the total of $14,520,300 reported for this class of construction in February, '34. Non-residential building awards in February likewise were higher than in February of last year but in this instance the gain over a year ago was only about 5½%. Large losses were reported from last year in the February awards for public works and public utilities.

19 Months of PWA

In the nineteen months that have elapsed since July, '33 when the effects of the PWA program were beginning to be felt in the contract records, publicly-owned construction jobs undertaken in the states east of the Rockies had a contract total of $1,569,120,400. During the same period and for the same area construction awards on private jobs aggregated $889,878,900. Thus, it is seen that almost 64% of the combined total of $2,458,999,300 for all classes of construction contracts let in the 37 eastern states beginning with August, '33 was on publicly-owned undertakings.

Contemplated construction of all types reported by F. W. Dodge Corp. during February was considerably heavier than in either the previous month or February, '34. Gains over '34 in new planning were shown in each important territory over the area east of the Rockies except the Central Northwest, Southern Michigan, the St. Louis territory and Texas. Newly-planned residential construction was more

Paint, Varnish and Lacquer Sales

	Total sales reported by 586 establishments	Classified sales reported by 344 establishments				Unclassified sales reported by 242 establishments
		Industrial sales			Trade sales of paint, varnish and lacquer	
1934		Total	Paint and varnish	Lacquer		
January	$20,600,562	$6,015,030	$4,290,923	$1,724,107	$ 7,470,517	$ 7,115,015
February	17,673,949	5,639,413	3,714,128	1,925,285	6,256,162	5,778,374
March	23,135,119	7,105,176	4,768,864	2,336,312	8,504,997	7,524,946
April	27,703,643	7,589,828	5,256,548	2,333,280	10,845,963	9,267,852
May	33,614,819	8,091,723	5,824,403	2,267,320	14,079,824	11,443,272
June	28,750,020	7,629,866	5,455,366	2,174,500	11,313,931	9,806,223
July	23,451,331	7,449,074	5,254,492	2,194,582	8,461,401	7,540,856
August	24,313,698	6,578,872	4,499,356	2,079,516	9,502,007	8,232,819
September	22,198,875	5,268,057	3,722,691	1,545,366	8,908,543	8,022,275
October	24,206,064	5,814,069	4,301,650	1,512,419	9,568,364	8,823,631
November	20,299,967	5,207,599	3,819,540	1,388,059	8,016,041	7,076,327
December	16,514,918	5,225,801	3,607,863	1,617,938	5,578,719	5,710,398
Total	$282,462,965	$77,614,508	$54,515,824	$23,098,684	$108,506,469	$96,341,988
1933						
January	$11,275,396	$3,529,886	$2,386,947	$1,142,939	$ 4,168,260	$3,577,250
February	11,665,734	3,423,033	2,445,378	977,655	4,771,706	3,470,995
March	13,578,568	3,391,947	2,484,550	907,397	5,788,213	4,398,408
April	19,043,787	4,677,309	3,143,803	1,533,506	8,582,411	5,784,067
May	26,241,044	5,991,938	4,298,455	1,693,483	11,788,573	8,460,533
June	27,813,233	6,827,509	4,832,551	1,994,958	12,443,998	8,541,726
July	22,090,187	6,406,184	4,493,516	1,912,668	8,627,400	7,056,603
August	20,620,811	6,323,475	4,754,701	1,568,774	7,840,359	6,456,977
September	19,097,803	5,544,686	3,975,917	1,568,769	7,462,113	6,091,004
October	18,944,106	4,949,755	3,721,420	1,228,335	7,376,012	6,618,339
November	16,234,234	4,656,353	3,466,174	1,190,179	6,566,157	5,011,724
Total (11 months)	$206,604,903	$55,722,075	$40,003,412	$15,718,663	$85,415,202	$65,467,626
December	16,156,062	4,418,023	3,428,376	989,647	6,157,567	5,580,472
Total (1933)	$222,760,965	$60,140,098	$43,431,788	$16,708,310	$91,572,769	$71,048,098
1932						
January	$15,894,506	Comparable statistics not available.				
February	16,270,822					
March	19,089,005					
April	22,612,193					
May	24,981,441					
June	19,637,358	$4,685,399	$3,617,719	$1,067,680	$8,734,330	$6,217,629
July	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
August	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
September	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
October	15,592,317	3,996,500	3,036,323	960,177	6,610,011	4,985,866
November	12,492,818	3,599,319	2,639,362	959,957	5,196,766	3,696,733
Total (11 months)	$193,838,795	....	....	....	....	....
December	9,484,520	$3,222,770	$2,186,706	$1,036,064	$3,506,715	$2,755,035
Total (1932)	$203,323,315	....	....	....	....	....

than 4 times as great as was reported in January and more than 6 times as heavy as recorded in February, '34.

Form Copper Paint Co.

Formation of National Copper Paint, an Illinois corporation, to manufacture and market newly evolved liquid paint of 98.3% purity, is announced by C. L. Welch, executive vice-president. Headquarters are at 666 Lake Shore Drive, Chicago. President is H. M. Rice, manager of the Nichols Copper, Chicago, a unit of Phelps-Dodge. Frederick A. McLauchlan, president of George B. Carpenter & Co., Chicago, one of the oldest U. S. mill supply distributing houses, is secretary and treasurer.

No. 1 plant of the company, containing approximately 50,000 sq. ft. of manufacturing space, has been established in Chicago and has just gone into production. See C. I., March, p. 221 for a technical description of this outstanding development in the paint field.

Cold Water Paints

Monthly statistics on sales of Plastic Paints, Cold Water Paints, and Calcimines, based on data reported to the Bureau of the Census by 53 identical manufacturers, are presented in the following table. Manufacturers included in these statistics produced more than 70% of the quantity and 80% of the value of plastic paints, and more than 91% of the quantity and 95% of the value of cold water paints and calcimines, reported at the Census of Manufactures for '33.

New Paint Displays

New and colorful window displays embodying emphatic recognition of the opportunity for profit under the National Housing Act, which are being made available by the National Clean Up and Paint Up Campaign Bureau (2201 N. Y. ave., N.W., Washington) are ready for shipment. There are 2 designs of these new displays, both of which are made by the oil paint process, in 12 colors, with real paint.

February Paint Exports

February paint products exported declined but slightly from January figures, despite the shorter month, increased 10% over February, '34 and were valued at $2,261,000. Impressive gains were registered in ready mixed paints, varnishes, carbon black and rosin, both in quantity and value, with only turpentine showing an appreciable loss.

Exports of ready mixed paint advanced 40% in quantity to 179,000 gals. and 35% in value to $296,160 compared with February, '34, and varnishes increased 17% in quantity and 34% in quantity and 15% in value to $99,200, statistics show.

Exports of mineral and chemical pigments advanced sharply. Former increased from 1,217,600 lbs. to 3,590,000, valued at $46,500, 52% in excess of the value for February, '34. Chemical pigments shipped abroad totaled 11,630,400 ($633,300), an increase of approximately 73% both in quantity and value compared with February, '34. Exports of carbon black, the most important item among chemical pigments, nearly doubled both in volume and value, totaling 10,037,500 lbs.

Rosin exports continued to advance in February and totaled 97,200 bbls., valued at $819,600, an increase of 28% in quantity and 32% in value compared with February, '34. Turpentine exports, however, continued to decline reaching the low level of 416,430 gals. ($207,720), about half the quantity and value of February, '34.

A.N.P.V. & L.A. Year Book

First year book of the N. P. V. & L. A. is off the press. A copy is being mailed to each A, B, and D member company of the Association, and to each C member whose parent company is not receiving a copy. Year book is a highly valuable record, linking years '33-'34 with the official set-up for '35. It covers the transition of the old Associations into the new one, with a record of the essentials at the convention in Chicago in '33, and a comprehensive summary of the proceedings at the convention in Washington in '34. Extra copies are $1.00.

Paint Personnel

R. M. Roosevelt, Eagle-Picher Lead vice-president, resigns to devote all of his time to the presidency of the American Zinc Institute. Willard E. Maston, vice-president, formerly at Cincinnati, will take charge in New York. F. W. Potts, vice-president, is now general manager; John R. Macgregor is to have charge of sales research and product development; and T. C. Carter is now director of sales.

John L. Reque is named sales manager of National Lead's white lead and linseed oil division, succeeding Frank C. Smith, who retired Jan. 1.

W. T. Williams and C. D. McQuade are additional representatives of the eastern sales division of McCloskey Varnish, according to Earl S. Opdyke, trade sales manager.

Paul Dean is now New England representative on shellac for William Zinsser & Co., and will have headquarters at 89 Broad st., Boston.

Harold Johnson is appointed advertising manager of Martin-Senour, succeeding Howard Weckel, now in charge of sales in the Central district.

P. H. Cathcart, formerly with Imperial Color, is now with Titanium Pigment covering Cleveland.

Item	1935 January	1934 December	1934 November	1934 October
PLASTIC PAINTS:				
Total:				
Pounds	315,400	275,105	402,925	418,003
Value	$22,665	$18,188	$27,864	$30,807
Paste (Lead, mixed paints and emulsified types):				
Pounds	22,698	15,810	39,345	61,057
Value	$1,752	$1,521	$3.218	$5,351
Dry:				
Total:				
Pounds	292,702	259,295	363,580	356,946
Value	$20,913	$16,667	$24,646	$25,456
Casein bound:				
Pounds	176,763	164,052	248,445	232,169
Value	$14,846	$12,297	$19,057	$18,250
Glue bound:				
Pounds	115,939	95,243	115,135	124,777
Value	$6,067	$4,370	$5,589	$7,206
COLD WATER PAINTS (IN DRY FORM):				
Total:				
Pounds	1,047,182	854,790	1,010,590	1,156,601
Value	$64,215	$52,869	$70,304	$78,496
Exterior:				
Total:				
Pounds	412,652	305,856	446,760	521,620
Value	$27,585	$21,132	$31,941	$37,802
Lime and/or cement bound:				
Pounds	206,414	161,143	230,740	317,519
Value	$15,355	$12,571	$18,744	$26,131
Casein bound:				
Pounds	206,238	144,713	216,020	204,101
Value	$12,230	$8,561	$13,197	$11,671
Interior:				
Total:				
Pounds	634,530	548,934	563,830	634,981
Value	$36,630	$31,737	$38,363	$40,694
Casein bound:				
Pounds	298,124	*266,973	*311,057	*330,548
Value	$26,790	*$23.701	*$29,609	*$30,862
Glue bound:				
Pounds	336,406	*281,961	*252,773	*304,433
Value	$9,840	* $8,036	* $8,754	* $9,832
CALCIMINES:				
Total:				
Pounds	6,472,708	5,353,015	5,322,963	6,630,336
Value	$284,758	$227,827	$225,078	$274,366
Hot Water:				
Pounds	3,259,345	2,360,482	2,603,461	3,800,148
Value	$147,643	$101,016	$104,915	$149,751
Cold Water:				
Pounds	3,213,363	2,992,533	2,719,502	2,830,188
Value	$137,115	$126,811	$120,163	$124,615

* Revised.

Fertilizers

¶*Phosphate Rock '34 Statistics—Ober Absorbed by Davison—Nash Opens Brokerage—*

Statistics furnished by producers of domestic phosphate rock in '34 showed gains of 16% over '33 in total mine production (2,677,277 long tons), 15% in total tonnage shipped or used (2,876,095 long tons) and 28% in total value of shipments ($10,039,422). In '34 phosphate rock was produced and shipped in Florida, Idaho, Tennessee, and Virginia; shipments from Florida and Tennessee amounted to more than 95% of the total. Total stocks in producers 'hands on Dec. 31, '34 (785,047 long tons), declined 21% compared with the preceding year. Average value of the rock, per long ton, at the mines in '34 was $3.49; in '33 it was $3.16.

No imports of phosphate rock or apatite were recorded during the first 11 months of '34. Phosphate rock exported from the U. S. in the first 11 months of '34 was as follows:

	Long tons	Value
High-grade rock	75,612	$ 522,700
Land pebble and other..	814,312	3,940,342
Total exports	889,924	$4,463,042

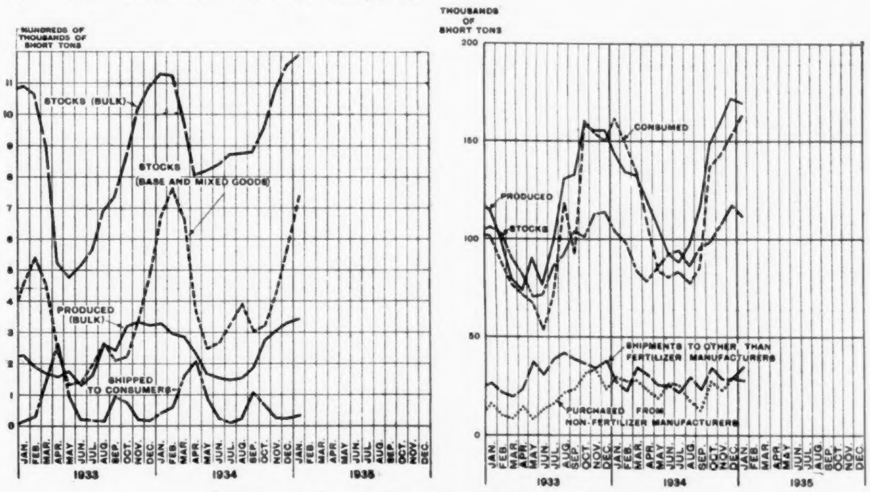
Important Price Changes

ADVANCED

	Mar. 30	Feb. 28
Bone meal	$24.00	$23.50

DECLINED

Blood, imported, ship.	$ 2.90	$ 3.00
Castor Pomace	18.00	18.50
Fish scrap, Japan	33.50	34.00
Nitrogenous material, imp.	2.45	2.65
Western	2.15	2.30
Tankage, grd., N. Y.	2.65	2.75
Unground	2.50	2.40



Left, trends in superphosphate; right, in sulfuric acid

Nash, Now a Broker

E. S. Nash is opening a fertilizer brokerage office at 301 American Bldg., Savannah, Ga. Office will operate under the name of E. S. Nash & Co. and will handle fertilizer materials of all kinds. Mr. Nash is well known to the fertilizer trade of the south, having been identified with the fertilizer manufacturing industry of Charleston, S. C., for many years. He was formerly vice-president of Merchants Fertilizer and Phosphate Co. of that city.

Ober Taken Over by Davison

The Gustavus Ober & Sons Co., Baltimore, which traces its history back nearly 80 years and is said to be the oldest manufacturer of fertilizer in the country, is absorbed by Davison Chemical, and is now a wholly owned subsidiary of Miller Fertilizer, which corporation holds the stock control. Old concern will not lose its identity, the officers long connected with it continuing.

Sulfuric, Superphosphate

Statistics on production, purchases, stocks, etc., of sulfuric, based on data reported to the Bureau of the Census by 69 fertilizer manufacturers for January, 1935, are presented. One manufacturer, previously reporting, went out of business in January, 1935.

(Quantities expressed in short tons; Northern District, States north of Virginia-North Carolina line; Southern District, States south of Virginia-North Carolina line)

Item	1935 Jan.	1934 Dec.	1934 Jan.
A—Production and Purchases:			
Produced by reporting establishments—Total	169,301	172,052	143,811
Northern District..	98,802	99,399	82,200
Southern District..	70,499	72,653	61,611
Purchased from fertilizer manufacturers—Total	34,545	36,734	32,312
Northern District..	13,705	12,330	13,697
Southern District..	20,840	24,404	18,615
Purchased from non-fertilizer manufacturers—Total	27,824	28,813	29,470
Northern District..	18,035	19,083	16,738
Southern District..	9,789	9,730	12,732
B—Consumed in Fertilizer Manufacture and Shipments:			
Consumed by reporting establishments in manufacture of fertilizer—Total	162,658	152,268	161,500
Northern District..	81,540	67,395	77,152
Southern District..	81,118	84,873	84,348
Shipments—To other than fertilizer manufacturers—Total ...	35,186	28,537	27,163
Northern District..	27,331	21,564	25,793
Southern District..	7,855	6,973	1,370
To fertilizer manufacturers—Total ...	39,693	47,367	26,664
Northern District..	24,304	35,581	17,738
Southern District..	15,389	11,786	8,926
C—Stocks on Hand:			
Total	111,397	117,036	104,465
Northern District..	82,044	84,449	74,534
Southern District..	29,353	32,587	29,931

Fertilizer Tax Tag Sales* for Seventeen States for the Month of December and Totals for Last Three Calendar Years

(Compiled by The National Fertilizer Association)

	December				Calendar Year		
	% of 1933	1934 Equiv. Tons*	1933 Equiv. Tons*	1932 Equiv. Tons*	% of 1933	1934 Equiv. Tons*	1933 Equiv. Tons*	1932 Equiv. Tons*
South:								
Virginia†	7	225	3,418	2,400	109	336,015	307,589	279,904
N. Carolina	68	22,200	32,656	21,066	99	876,874	889,310	696,167
S. Carolina	60	19,375	32,523	10,845	98	572,279	581,515	446,027
Georgia	62	12,904	20,870	865	132	549,275	416,283	357,352
Florida†	58	34,841	59,941	46,922	120	423,032	352,897	381,178
Alabama	28	3,600	12,850	1,900	125	358,450	287,350	205,400
Mississippi	1	104	17,650	900	156	162,067	104,191	84,526
Tennessee†	600	600	100	2	120	92,457	76,827	62,956
Arkansas‡	..	0	350	0	188	41,620	22,140	17,348
Louisiana†	23	1,500	6,600	200	124	76,326	61,514	49,376
Texas†	78	2,115	2,706	50	167	55,923	33,571	34,185
Oklahoma	..	200	0	0	251	4,990	1,985	2,925
Total South	51	97,664	189,664	85,150	113	3,549,309	3,135,172	2,617,344
Midwest:								
Indiana	201	213	106	63	152	149,003	97,862	80,384
Illinois	57	263	463r	38r	117	20,283r	17,392r	16,338r
Kentucky	0	0	0	0	107	62,520	58,272	55,220
Missouri	..	41	1	100	161	52,259	32,422	26,427
Kansas	500	25	5	27	317	5,497	1,735	2,546
Total Midwest ...	94	542	575	228	139	289,562	207,683	180,915
Grand Total	52	98,206	190,239	85,378	115	3,838,870	3,342,855	2,798,259

* Monthly records of fertilizer tax tags are kept by State Control Officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States.

† Cottonseed meal sold as fertilizer included

‡ Excludes 41,294 tons of cottonseed meal for January-December combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

r Revised.

Monthly statistics on production, receipts, shipments, and stocks of superphosphates, based on data reported to the Bureau of the Census by 69 manufacturers, are presented. One manufacturer, previously reporting, has gone out of business. Manufacturers included produced more than 95% of the total value reported at the Census of Manufactures for 1933.

Item	1935 Jan.	1934 Dec.	1934 Jan.
A—Production and Receipts (Short Tons):			
Production—Bulk superphosphates—Total, U. S.	342,210	332,140	328,345
Northern District	175,208	160,935	158,784
Southern District	167,002	171,205	169,561
Base and mixed goods—Total, U. S.	12,895	9,912	14,223
Northern District	4,189	3,743	4,040
Southern District	8,706	6,169	10,183
Received from other acidulators (including inter-company transfers)[1]—Total, U. S.	43,145	38,318	37,078
Northern District	24,945	24,998	14,019
Southern District	18,200	13,320	23,059
B — Shipments (Short Tons):			
Bulk superphosphates—Total, U. S.	145,702	121,027	137,192
Northern District	72,957	67,478	68,338
Southern District	72,745	53,549	68,854
To mixers—Total, U. S.	81,183	70,930	68,681
Northern District	44,545	46,025	43,085
Southern District	36,638	24,905	25,596
To other acidulators (including inter-company transfers)—Total, U. S.	29,966	26,739	27,959
Northern District	18,525	14,392	17,841
Southern District	11,441	12,347	10,118
To consumers—Total, U. S.	34,553	23,358	40,552
Northern District	9,887	7,061	7,412
Southern District	24,666	16,297	33,140
Base and mixed goods—Total, U. S.	47,063	38,310	44,988
Northern District	9,431	10,068	11,613
Southern District	37,632	28,242	33,375
C—Stocks (Short Tons):			
Bulk superphosphates—Total, U. S.	1,189,505	1,159,392	1,130,174
Northern District	497,205	456,542	486,674
Southern District	692,300	702,850	643,500
Base and mixed goods—Total, U. S.	738,351	567,974	671,692
Northern District	294,494	213,291	281,786
Southern District	443,857	354,683	389,906

[1] Includes both bulk superphosphates and base and mixed goods.

U. S. Imports and Exports of Fertilizer and Fertilizer Materials by Classes—Total for All Countries—Long Tons

(Summarized by The Nat'l Fertilizer Ass'n from Dept. of Commerce Preliminary Reports)

	December 1934**	December 1933	December 1932	Calendar Year 1934**	Calendar Year 1933	Calendar Year 1932
IMPORTS						
Ammonium sulphate	4,138	22,801	15,225	185,301	351,254	307,311
Ammonium-sulphate-nitrate	0	1	0	0	1	0
Calcium cyanamide	7,636	10,386	4,657	82,458	63,842	62,543
Calcium nitrate	1,984	801	1,650	33,369	17,312	6,860
Guano	313	1,675	2,433	16,638	59,772	24,231
Dried blood	334	128	501	3,727	6,380	3,739
Sodium nitrate	17,085	23,508	48	293,527	122,866	50,430
Urea and calurea	198	102	215	5,383	6,043	3,829
Ammonium phosphates	622	476	*	9,955	4,140	*
Tankage	1,131	1,268	2,565	13,449	25,017	21,130
Castor pomace	2,283	*	*	18,017	*	*
Other nitrogenous	6,361	5,048	3,466	102,207	57,497	33,708
Total nitrogenous materials	42,085	66,194	30,760	764,031	714,124	513,781
Bone phosphates	1,680	1,540	3,480	15,948	28,500	30,118
Superphosphates	687	289	1,450	16,308	23,705	21,855
Phosphate rock	0	0	0	0	7,725	6,350
All other phosphates	44	0	0	131	863	8,936
Total phosphate materials	2,411	1,829	4,930	32,387	60,793	67,259
Muriate of potash	13,954	13,966	1,355	126,964	105,538	78,358
Kainite, 14%	134	10,039	720	19,119	43,131	49,374
Kainite, 20%	8,582	12,489	‡	94,779	58,858	‡
Manure sales, 30%	9,931	9,925	3,596	79,283	113,121	100,927
Sulphate of potash	4,009	3,094	1,450	43,074	45,535	28,071
Sulphate of potash magnesia	2,078	1,743	*	18,712	13,790	*
Nitrate of potash	5,326	343	*	31,614	25,593	*
Other potash	1	1	7	352	449	351
Total potash materials	44,015	51,600	7,128	413,897	406,015	257,081
Nit-phos-pot. fertilizers	22	89	387	1,916	1,875	3,346
Other fertilizers	3,274	4,431	4,755	49,942	67,632	49,245
Grand Total	91,807	124,143	47,960	1,262,173	1,250,439	890,712
EXPORTS						
Ammonium sulphate	1,006	2,289	49	25,629	14,328	14,742
Other nitrogenous chemicals†	11,756	11,650	16,842	157,915	91,348	166,981
Nitrogenous organic waste	853	2,885	1,294	16,713	11,086	8,927
Total nitrogenous materials	13,615	16,824	18,185	200,257	116,762	190,650
High grade hard rock	22,000	0	178	97,612	42,364	66,009
Land pebble rock	81,569	54,179	48,983	895,881	786,695	547,026
Total phosphate rock	103	54,179	49,161	993,493	829,059	613,035
Superphosphate	3,546	4,357	3,027	59,150	35,371	23,883
Other phosphate materials	198	1,351	126	6,153	3,385	1,195
Total phosphate materials	107,313	59,887	52,314	1,058,796	867,815	638,113
Potash fertilizers	3,117	2,595	468	24,991	25,117	1,816
Concentrated chem. fertilizers	2,724	1,962	96	19,460	15,472	14,565
Prepared fertilizer mixtures	312	131	73	2,927	2,599	1,608
Grand Total	127,081	81,399	71,136	1,306,431	1,027,765	846,752

* Not previously stated separately. ‡ Included in kainite, 14%. † Chiefly domestic synthetic sodium nitrate. ** The IMPORT figures for 1934 represent the imports entered for consumption plus withdrawals from warehouses for consumption.

February Tag Sales

The N.F.A. places sales of fertilizer during February, as indicated by tag sales, at 686,276 tons, or 37% more than the total of 501,653 tons sold February last year. Sales for the first 2 months this year increased 17% over the same period last year.

Advertising Appropriations

Metropolitan Life Insurance Co. issues a report on the advertising appropriations of fertilizer manufacturers. Data shows expenditure ranging from 2.5c to 50c per ton of fertilizer for advertising. For the past few years, advertising appropriations have been considerably lower than normal.

Butler's 60 Years

Edward Butler, Jr., Philadelphia, Pa., on Mar. 5, celebrated the 60th anniversary of his service with the Baugh Companies. He was for many years treasurer, a director, and member of the NFA executive committee.

Roberts Appointed

Joseph F. Battley, NRA division administrator announces appointment of Major Ovid E. Roberts, Jr., as administrative member without vote of the Fertilizer Code Authority.

German Fertilizer Notes

Germany is placing in effect a temporary reduction in nitrogen prices, hoping that increased consumption will offset the loss in lower quotations.

German Potash Syndicate's '34 sales of 1,220,000 metric tons compare with 937,000 in '33, and 837,000 in '32.

Chilean Nitrate Exports

During the first 7 months of the '34-'35 fiscal year Chilean nitrate exports approximated 687,000 metric tons as compared with 620,000 tons and 53,000 tons during the corresponding periods of '33-'34 and '32-33.

Naval Stores

Turpentine & Rosin Factors of Savannah, will erect a large still at Statesboro, Ga., for the manufacture of crude materials into a finished product. It has a large assemblying plant on property belonging to the Georgia & Florida Railway. Still will manufacture the product and convey it to a 19,000-gallon storage tank.

C. C. Crook, well-known in naval stores, is now sales manager of Nelio-Resin, with Jacksonville headquarters.

Jay Ward of the AAA is appointed to the post of managing agent for the license for processors of wood turpentine and wood rosin.

Oils and Fats

¶*Tung Oil Exports Summarized — Fats and Oils Statistics Released—New Oil Trades Association Officers—*

Hankow tung oil exports increased substantially in December, depleting stocks almost to the point of exhaustion. Exports totalled 7,522,000 lbs. compared with 2,750,000 lbs in November and 10,276,000 lbs. in December, '33. As usual the U. S. was the largest customer, taking 6,448,000 lbs. compared with 2,570,000 during the preceding month. Shipments to Europe amounted to 1,074,000 lbs. compared with 180,000 lbs. in Nov., '34, and 2,242,000 in Dec., '33. Stocks on hand at the end of December amounted to only 30 short tons, compared with 200 at the end of November and 2,470 at the end of Dec., '33. Shortage of stocks at the end of '34 was due in part to heavier shipments during December, and in part to a smaller crop. The new Chinese tung oil crop begins coming on the market in October.

Total '34 tung oil shipments, 106,503,000 lbs., was a decline of 27% as compared with the preceding year, but approximately the same as for '32. Shipments to the U. S. declined 26% to 85,541,000 lbs. and shipments to Europe declined 39% to 18,314,000 lbs. A total of 2,648,000 lbs. were shipped to Shanghai during the year, against none for '33, bulk of which it is thought was re-exported to the U. S.

Exports of tung oil from Hankow to the United States, Europe and Shanghai during the periods referred to, are shown below.

Production in Dec. Quarter

Bureau of the Census announces that the factory production of fats and oils (exclusive of refined oils and derivatives) during the 3-month period ended Dec. 31, '34, was as follows: Vegetable oils, 730,259,920 lbs.; fish oils, 98,116,000 lbs.; animal fats; 498,603,199 lbs.; and greases, 89,257,099 lbs.—a total of 1,416,236,218 lbs. Of the several kinds of fats and oils covered by this inquiry, the largest production 478,279,723 lbs., appears for cottonseed oil. Next in order is lard with 334,958,581 lbs.; tallow with 161,602,761 lbs.; linseed oil with 90,253,182 lbs.; coconut oil with 61,237,753 lbs.; peanut oil with 39,911,719 lbs.; corn oil with 26,384,841 lbs.; soy oil with 16,779,450 lbs.; and caster oil with 10,542,055 lbs.

Production of refined oils during the period was as follows: Cottonseed, 434,516,791 lbs.; coconut, 80,657,953 lbs.; peanut, 22,445,249 lbs.; corn, 29,515,120 lbs.; soybean, 8,604,303 lbs.; and palm-kernel, 1,410,625 lbs. Quantity of crude oil used in the production of each of these refined oils is included in the figures of crude consumed.

Data for the factory production, factory consumption, imports, exports and factory and warehouse stocks of fats and oils and for the raw materials used in the production of vegetable oils for the 3-month period appear below.

Sonneborn Elected

New offices of the Oil Trades Association of N. Y. are: President, Rudolph G. Sonneborn, of L. Sonneborn, Sons, Inc.; vice-president, George V. Bacon, secretary, Joseph C. Smith, of the Smith-Weihman Co.; treasurer, Philip G. Meon, of Borne-Scrymser. Directors, Charles V. Bacon, Joseph B. Cleaver, George E. Getchell, Philip C. Meon, John F. Renick, Lawrence A. Ryan, J. Walter Saybolt, Joseph C. Smith, Rudolph G. Sonneborn, Albert J. Squier, George Suraud, Homer F. Wilhelm, and John C. Wolke.

Rowlands Expands

Lamont Rowlands, already possessing a 9,000-acre tung tree grove near Picayune, Miss., is now planting over 1,000,000 tung seed, with the expectation of having a million young tung trees to be transplanted into 10,000 acres of land with which he plans to double his acreage next winter. Likewise of much interest, he is also planting 500 acres in soy beans, from which he expects to extract oil, using the same process which he will use in extracting tung oil. See C. I., August, p120 for an interview with Lamont Rowlands.

Form New Company

Sidney P. Craven and William B. Mullen, recently with Welch, Holme & Clarke, have formed Eastern Industries, Inc., with offices at 125 Bergen st., Harrison, N. J. Company will deal in vegetable and animal oils, stearic acid, oleic acid, oleine, fatty acids, grease, and tallow.

Hoaglund Appointed

Brown-Edwards Co., Chicago fats and oils brokers, appoints Howard Hoaglund as technical and sales representative.

	Total Exports lbs.	Exports to U. S. lbs.	Exports to Europe lbs.	Exports to Shanghai lbs.	Hankow Stocks Short Ton
Dec., 1934	7,522,000	6,448,000	1,074,000	....	30
Nov., 1934	2,750,000	2,570,000	180,000	....	200
Dec., 1933	10,276,000	8,034,000	2,242,000	....	2,470
Year, 1934	106,503,000	85,541,000	18,314,000	2,648,000	....
Year, 1933	146,022,000	116,044,000	29,978,000	....	....

PRODUCTION, CONSUMPTION, AND STOCKS OF FATS AND OILS

(In some cases, where products were made by a continuous process, the intermediate products were not reported. Stocks include imports not yet withdrawn.)

Kind	Factory operations for the quarter ended Dec. 31, 1934 — Production lbs.	Factory operations for the quarter ended Dec. 31, 1934 — Consumption lbs.	Factory and Warehouse stocks Dec. 31, 1934 lbs.
VEGETABLE OILS (1):			
Cottonseed, crude	478,279,723	467,526,395	95,266,790
Cottonseed, refined	434,516,791	352,208,731	516,717,045
Peanut, virgin and crude	39,911,719	24,248,176	13,358,063
Peanut, refined	22,445,249	8,823,749	12,973,968
Coconut or copra, crude	61,237,753	124,715,289	152,747,045
Coconut or copra, refined	80,657,953	94,292,088	34,276,960
Corn, crude	26,384,841	32,286,245	15,904,405
Corn, refined	29,515,120	11,228,115	11,241,268
Soybean, crude	16,779,450	11,730,455	14,311,782
Soybean, refined	8,604,303	6,197,984	4,413,543
Olive, edible	232,889	555,551	1,811,824
Olive, inedible	....	2,338,325	1,625,869
Sulphur oil or olive foots	....	6,418,748	15,804,252
Palm-kernel, crude	(2)	8,193,450	2,847,905
Palm-kernel, refined	1,410,625	1,126,460	1,407,556
Rapeseed	....	3,364,116	12,853,389
Linseed	90,253,182	54,337,585	113,721,618
Chinawood	....	24,388,452	30,092,056
Perilla	(2)	3,735,556	3,772,077
Castor	10,542,055	4,763,722	12,284,045
Palm	....	36,299,995	76,969,170
Sesame	2,405,923	1,431,653	2,656,226
Sunflower	....	377,711	639,060
All other	4,232,385	4,426,264	4,872,467
FISH OILS (1):			
Cod and cod-liver	725,652	3,072,487	10,299,395
Other fish oils	(3) 96,868,723	37,965,453	170,334,839
Marine animal oils	(4) 521,625	5,320,317	61,572,970

(1) The data of oils produced, consumed, and on hand by fish oil producers and fish canners were collected by the Bureau of Fisheries.
(2) Included in "All other" vegetable oils.
(3) Includes 87,014,329 pounds herring and sardine, 8,717,934 pounds menhaden and 1,136,460 pounds of miscellaneous fish oils.
(4) Whale oil exclusively. No production of sperm oil.

Important Wax Price Changes

ADVANCED

	Mar. 30	Feb. 28
Beeswax, Chilean	$0.23	$0.22
Brazilian	.23	.22
Candelilla	.11	.10¾
Carnauba, No. 1, Yellow	.38½	.36½
No. 2, Yellow	.37½	.36
No. 2, N. C.	.31	.28
No. 3, Chalky	.27½	.24½
No. 3, N. C.	.28½	.26
Japan	.07½	.06¾

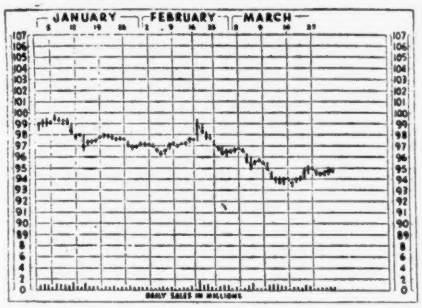
DECLINED
None.

Chemical Finances

Stock Market Again Shows Net Losses for Month—Chemical Stocks Go Lower in Dull Trading—Earnings Statements are Encouraging—

The stock market in March failed to rise out of the doldrums of the past few months and another period of net losses in value must be recorded. The Street is simply marking time and aside from a minor flurry now and then interest both on the part of the public and the professionals is at a very low ebb. Since the first of the year there has been little news of the type that would be likely to arouse very much enthusiasm. Certainly the decline in the price of cotton, the pessimistic picture in Europe, the legislative deadlock in Washington could not be conductive to a forward movement in stock values. The market must find something concrete on which to build a bull movement and that something at the moment seems a long ways off. The chemical stocks joined the downward surge last month and substantial losses occurred in nearly all leaders. In the group shown, Monsanto alone escaped without a net loss for the month. Yearly financial statements continue to show, generally speaking, higher net profits for '34 than for the preceding year. But one or 2 exceptions are noted.

Daily Record of Stock Market Trend



—N. Y. Herald-Tribune

Company Earnings

Cyanamid and subsidiaries for year ended Dec. 31, certified by independent auditors, shows consolidated net profit of $2,495,644 after depreciation, depletion, interest, federal taxes, minority interest, etc., equivalent to 99c a share (par $10) on combined 2,520,370 shares of Class A and B common outstanding at end of the period, including shares reserved for stocks not yet presented for exchange, but excluding 157,672 shares of Class B held by subsidiaries. This compares with consolidated net profit in '33, of $2,467,682 equal to 99c a share on combined 2,490,373 Class A and B.

Carbide's Net $20,277,442

Carbide reports for '34 a consolidated net income of $20,277,442 after all charges and reserves for depreciation and depletion. This was equal to $2.25 a share on the 9,000,743 shares of capital stock outstanding. It compared with a net income of $14,172,927, or $1.57 a share, in '33.

Consolidated Chemical Reports Profit

Consolidated Chemical Industries reports for the year ended Dec. 31, net profit of $457,278 after depreciation, federal taxes, etc., equivalent under the participating provisions of the shares, to $1.50 a share on combined 205,000 shares of Class A stock and 80,000 shares of Class B stock. This compares with $445,902 or $1.56 a share on combined 205,000 Class A shares and 80,000 Class B shares in 1933. Class A preference stock is preferred as to dividends of $1.50 per share per annum and participates equally share for share with Class B after latter has received $1.50 per annum.

Anglo-Chilean Nitrate Has Loss

Statement of Anglo-Chilean Nitrate and its subsidiary, Motorship Caliche Corp., for year ended June 30, 1934, shows net deficit transferred to surplus account of £626,991 after taxes, interest, depreciation of railroad, port properties and tanker and other deductions.

It is stated by the auditors that with the exception of the railroad, port properties and tanker, no provision for depreciation of capital assets, depletion of nitrate reserves, or for amortization of bond discount expense has been made in arriving at the deficit for year ended June 30, 1934.

Merck's '34 Net $983,272

Report of Merck & Co., Inc., (new company) and subsidiaries for year ended Dec. 31, '34, certified by independent auditors shows net income of $983,272 after depreciation, federal taxes and other de-

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs., ext..	25c	Mar. 18	Apr. 1
Abbott Labs.	50c	Mar. 18	Apr. 1
Air Reduction ...	75c	Mar. 30	Apr. 1
Allied Chem., & Dye	$1.50	Apr. 9	May 1
Allied Chem., & Dye, pf.	$1.75	Mar. 11	Apr. 1
Amer. Agr. Chem.	50c	Mar. 18	Mar. 30
American Cyanamid A & B	10c	Mar. 16	Apr. 1
Atlas Powder, pf. .	$1.50	Apr. 19	May 1
Canadian Industries	$1.75	Mar. 30	Apr. 15
Chickasha Cotton Oil	50c	Mar. 5	Apr. 1
Clorox Chemical, ext.	12½c	Mar. 20	Apr. 1
Clorox Chemical..	50c	Mar. 20	Apr. 1
Colgate-Palmolive-Peet	12½c	May 6	June 1
Colgate-Palmolive-Peet, pf.	$1.50	Mar. 5	Apr. 1
Commercial Solvents, ext.	25c	Mar. 6	Mar. 30
Consol. Chem. Ind., pf.	37½c	Apr. 15	May 1
Corn Products....	75c	Apr. 2	Apr. 15
Corn Products, pf.	$1.75	Apr. 2	Apr. 15
Devoe & Raynolds, A & B, ext. ...	25c	Mar. 20	Apr. 1
Devoe & Raynolds, A & B	25c	Mar. 20	Apr. 1
Devoe & Raynolds, 1st pf.	$1.75	Mar. 20	Apr. 1
du Pont	$1.50	Apr. 10	Apr. 25
Eastman Kodak ..	$1.25	Mar. 5	Apr. 1
Eastman Kodak, pf.	$1.50	Mar. 5	Apr. 1
Formica Insulation	20c	Mar. 15	Apr. 1
General Printing Ink	30c	Mar. 18	Apr. 1
General Printing Ink, pf.	$1.50	Mar. 18	Apr. 1
Glidden Co., ext. .	15c	Mar. 18	Apr. 1
Glidden Co., pf. ..	$1.75	Mar. 18	Apr. 1
Glidden Co.	25c	Mar. 18	Apr. 1
Hercules Powder, pf.	$1.75	May 3	May 15
Imp. Chem. Indust.	5½%	Apr. 20	June 8
Imp. Chem. Indust., def'd	2%		
Industrial Rayon..	42c	Mar. 20	Apr. 1
Int. Nickel of Can., pf.	$1.75	Apr. 1	May 1
Int. Nickel of Can.	15c	Feb. 28	Mar. 30
Int. Printing Ink, sp.	25c	Apr. 15	May 1
Int. Printing Ink, pf.	$1.50	Apr. 15	May 1
Koppers Gas & Coke, pf.	$1.50	Mar. 12	Apr. 1
Liquid Carbonic ..	25c	Apr. 16	May 1
Mac Andrews & Forbes	50c	Mar. 30	Apr. 15
Mac Andrews & Forbes, pf.	$1.50	Mar. 30	Apr. 15
Mathieson Alkali..	37½c	Mar. 4	Apr. 1
Mathieson Alkali, pf.	$1.75	Mar. 4	Apr. 1
Merck & Co., Int.	10c	Mar. 18	Apr. 1
Merck & Co., pf. ..	$2.00	Mar. 18	Apr. 1
National Carbon, pf.	$2.00	Apr. 20	May 1
National Lead ...	$1.25	Mar. 15	Mar. 30
National Lead, pf. B	$1.50	Apr. 19	May 1
Paraffine Cos. ...	50c	Mar. 16	Mar. 27
Penn. Salt Mfg...	75c	Mar. 30	Apr. 15
Pratt & Lambert..	25c	Mar. 15	Apr. 1
Procter & Gamble, 8% pf.	$2.00	Mar. 25	Apr. 15
Spencer Kellogg..	40c	Mar. 15	Mar. 30
Union Carbide ...	40c	Mar. 8	Apr. 1
United Dyewood, pf.	$1.75	Mar. 14	Apr. 1
United Carbon ...	60c	Mar. 16	Apr. 1
U. S. I.	50c	Mar. 15	Mar. 30
Westvaco Chlorine, pf.	$1.75	Mar. 15	Apr. 1

Price Trend of Chemical Company Stocks

	Feb. 28	Mar. 15	Mar. 30*	Net gain or loss past month	Price on Mar. 31, 1934	1935 High	1935 Low
Air Reduction	112	107	110½	—1½	95	115¾	104⅜
Allied Chemical	134	129¼	131¾	—2¼	153	141	125
Columbian Carbon	74¾	72½	73½	—1¼	67	79¾	67
Com. Solvents	20⅞	18¾	19¼	— ⅝	29	23⅞	17⅝
du Pont	92¾	128⅛	89½	—3¼	95⅜	130	126⅞
Hercules	75	71	71	—4	68	77⅝	71
Mathieson	27	24⅜	26	—1	35¼	32	26
Monsanto	58⅝	57	59	+ ⅜	87†	60½	55
Std. of N. J.	38	36½	37	—1	.....	43½	35¾
Texas Gulf Sulphur	33¼	31½	30	—3¼	37	36¾	29½
Union Carbide	46⅞	45¼	46⅛	— ¾	44½	49	44
U. S. I.	40	36½	38¼	—1¾	51½	45½	35⅛

* Last day of the month; † Old stock.

ductions but exclusive of surplus credits and charges. After allowance for annual dividend requirements on 51,395 shares (par $100) of 8% cumulative preferred stock the balance of $572,112 is equal to $1.91 a share (par $1) on 300,000 shares of common stock.

Consolidation of Merck & Co., Inc., with Merck Corp. was consummated on Dec. 29, '34. Statement is a consolidated profit and loss account covering both corporations for '34.

Current assets as of Dec. 31, '34, including $1,849,319 cash and U. S. Treasury discount bills at cost, amounted to $6,243,475 and current liabilities were $670,414.

Queeny Reports on Monsanto

Consolidated sales of Monsanto and its subsidiaries for '34 were 14% greater than for '33 and the largest in the company's history, according to the annual report. Earnings for '34 as previously reported by Edgar M. Queeny, president, were $2,771,-629.29 or $3.20½ a share on the 864,000 shares outstanding. These earnings include Monsanto's proportion of the undivided profits of controlled companies not consolidated and uncontrolled companies. Earnings for '33, after giving effect to the 100% stock distribution of last April amounted to $2.57 a share, a record surpassed only by '34.

Net current assets are reported at $7,-540,832, an increase of $2,224,291 over last year, and total assets at an all time peak of $26,904,720. Expenditures for research in '34 totalled $456,356, an increase of 11% over '33. A much larger amount has been budgeted for '35.

In his report, President Queeny states that Monsanto received no direct benefits from NRA. Consumption of chemicals by the so-called heavy industries was only slightly greater than in '33. New avenues of consumption of some chemicals and satisfactory demands from the plastic, rubber, paint and pharmaceutical industries, however, aided sales.

"The Securities Act of '33 greatly contributed to the difficulties of financing by American industry," Mr. Queeny states in his report. "Monsanto was fortunate to have a British subsidiary to form the vehicle for the procurement of needed additional capital. In September, £400,-000 out of an authorized £500,000 of 5½% non-voting cumulative preferred stock in Monsanto Chemicals, Ltd., was sold through bankers to the British investors at 102½ of par. Confidence of the British investing public in their money, as well as in the chemical industry, was evident by the heavy over subscription of this issue which bears no sinking fund nor guarantee by the parent company. It is now selling on the London Stock Exchange at a substantial premium over the issue price. Proceeds of this issue will be used for expansion of our British properties and to repay our American treasury for past advances."

According to the report, Monsanto faces the largest construction program in its history, in excess of $4,000,000 having been budgeted for replacements, extensions to plant required by increased demand, plant for new products, and auxiliary facilities.

United Carbon—$3.55 a Share

United Carbon and subsidiaries report, including operations of Texas Carbon Industries, Inc., from date of acquisition early in Dec., for year ended Dec. 31, '34, shows net profit of $1,452,939 after depreciation, depletion, federal taxes and reserve for contingencies. This is equal after deducting $51,728 dividends paid on preferred stock (retired July 2, '34), to $3.55 a share on 394,327 common outstanding at close of year, after sale of 24,200 treasury shares sold in Dec. For year ended Dec. 31, '33, company reported profit of $636,217 before federal taxes.

Texas Gulf Sulphur Report

Other important yearly financial statements issued within the past 30 days included: Texas Gulf Sulphur. Net income after depreciation, amortization, Federal taxes and other charges, $6,958,-476, equal to $1.81 a share on 3,840,000 no-par capital shares outstanding, compared with $7,443,613, or $2.93 a share on 2,540,000 shares, in '33. Income account for '34 is not strictly comparable with that of prior years since company reported net income after depreciation but before amortization in previous years. Current assets on Dec. 31, '34, including $6,111,676 cash and $3,034,283 U. S. Treasury notes and certificates, amounted to $25,083,072, and current liabilities were $1,531,540, compared with cash of $7,801,448, current assets of $22,960,453 and current liabilities of $1,516,497 on Dec. 31, '33. Current assets include inventories.

The Catalin Corp. of America (cast phenolics) reports net earnings, after depreciation and all other charges, but before Federal taxes, aggregated $260,154 in '34, compared with $97,838 in '33. Dollar and pound class sales in '34 increased approximately 75% over '33 volume. Company has 536,892 shares of capital stock outstanding.

I. C. I. Earnings

Imperial Chemical Industries, Ltd. (England)—For 1934: Profit after allocating £1,000,000 to obsolescence and depreciation and providing £615,931 for income taxes, £6,349,107. Directors transferred £1,000,000 to general reserve.

I. C. I.'s Dividend Announcement

Imperial Chemical Industries announces a final dividend of 5½% on £43,000,000 of ordinary shares, making 8% for '34, and a dividend of 2% on the preferred shares. Profit was a record, as gross income was more than £300,000 higher than in '33 and approached £8,000,000.

It is proposed to simplify the capital structure by amalgamating the ordinary and deferred shares into one class. The announcement is held to be of great importance to the British industrial market.

Kellogg Stock Reduction

N. Y. Stock Exchange receives notice from Spencer Kellogg & Sons, Inc., of proposed reduction in authorized capital stock from 600,000 shares without par value to 500,000 shares without par value and increase to 700,000 shares without par value.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1934	Net income 1933	Common share earnings 1934	Common share earnings 1933	Surplus after dividends 1934	Surplus after dividends 1933
Air Reduction:							
Year, Dec. 31	§$3.00	$4,145,416	$3,192,732	*h*$4.98	*h*$3.79	$408,275	$37,914
American Cyanamid:							
Year, Dec. 31	*z*.10	2,495,644	2,467,682	*h*.99	*h*.99	1,621,018	....
Callahan Zinc Lead:							
Year, Dec. 31	*f*....	†46,551	†33,346	....	....	......	....
Internat'l Nickel Co. of Can., Ltd.:							
Dec. 31, quarter	*z*.15	4,469,670	4,026,565	.27	.24	1,799,470	....
Year, Dec. 31	*z*.15	18,487,479	9,662,584	1.13	.53	9,264,496	....
Lindsay Light Co.:							
Year, Dec. 31	.40	44,674	33,182	.50	.31	......	....
Newport Industries, Inc.:							
Year, Dec. 31	*f*....	161,619	....	.31	....	......	....
Pittsburgh Plate Glass:							
Year, Dec. 31	2.00	5,763,684	3,993,934	2.69	1.86	2,659,070	2,495,371
Texas Gulf Sulphur:							
Year, Dec. 31	2.00	6,958,476	7,443,613	*h*1.81	*h*2.93	1,228,476	4,268,613
Vanadium Corp. of America:							
Year, Dec. 31	*f*....	†861,017	†905,560	....	....	......	....

Annual Financial Statements

Company:	Fixed chgs. times earn.	Pfd. div. times earned	Cash and mark. securities	Inventories	Ratio cur. assets to cur. liab.	Working capital
Allied Chemical & Dye Corp.:						
Year, Dec. 31, 1933 ..	No fd. dbt.	5.31	*b*49,534,866	22,878,590	8.7	75,349,612
Year, Dec. 31, 1934 ..	No fd. dbt.	6.38	*b*$55,259,542	$20,639,325	8.3	$77,927,247
Int'l Nickel Co. of Canada, Ltd.:						
Year, Dec. 31, 1934 ..	No fd. dbt.	9.56	$20,555,118	$20,683,443	7.5	$40,172,901
Year, Dec. 31, 1933 ..	No fd. dbt.	4.99	15,616,012	18,720,125	8.0	35,200,851

§ Plus extras; *h* On shares outstanding at close of respective periods; *z* Last dividend declared; period not reported by company; f No common dividend; † Net loss.

Chemical Stocks and Bonds

Last	1935 March High	1935 March Low	1934 High	1934 Low	1933 High	1933 Low	Sales: Number of shares March 1935	Sales: Number of shares 1935	Stocks	Par $	Shares Listed	An. Rate*	Earnings $-per share-$ 1934	Earnings $-per share-$ 1933
NEW YORK STOCK EXCHANGE														
110½	115¾	104⅜	113	91¼	112	47½	7,500	25,300	Air Reduction	No	841,288	$4.50	4.98	3.79
131¾	141	125	160¾	115⅛	152	70¼	14,200	37,900	Allied Chem. & Dye	No	2,214,099	6.00	6.83	5.50
125	127½	123¾	130	122⅛	125	115	1,100	4,000	7% cum. pf.	100	345,540	7.00	50.79	42.24
47	57¾	45	48	25¼	35	7¼	4,900	36,100	Amer. Agric. Chem.	100	315,701	2.00	.....	p4.19
24⅜	33¼	22½	62½	20¾	89⅞	13	19,600	56,200	Amer. Com. Alcohol	20	260,716	None	.....	4.56
39	41¼	36	39⅛	26¼	29¼	9¾	6,500	24,500	Archer-Dan-Midland	No	541,546	1.50	.....	p3.82
34	43	33	55½	35¼	39⅛	9	7,900	16,300	Atlas Powder Co.	No	234,235	2.00	2.49	.74
110⅝	110⅝	106¼	106¾	83	83⅛	60	590	1,390	6% cum. pfd.	100	88,781	6.00	13.54	8.38
20⅝	35⅜	19⅝	44⅞	17⅛	58⅞	4½	63,100	201,700	Celanese Corp. Amer.	No	987,800	None	1.25	3.32
16¾	18¼	16⅛	18½	9⅜	22⅜	7	34,900	103,900	Colgate-Palm.-Peet	No	1,985,812	.75	1.16	— .57
103⅛	105½	101	102½	68⅛	88	49	1,700	7,600	6% pfd.	100	254,500	6.00	.....	1.51
73½	79¾	67	77⅛	58	71½	23⅛	13,000	43,500	Columbian Carbon	No	538,154	3.40	3.93	2.17
19¼	23⅞	17⅝	36¾	15¾	57¼	9	85,800	346,100	Commer. Solvents	No	2,635,371	.85	.89	.88
65⅛	68	62	84½	55½	90⅝	45⅜	18,700	56,500	Corn Products	25	2,530,000	3.00	.....	3.87
158	158	149	150⅛	135	145¾	117½	400	2,400	7% cum. pfd.	100	243,739	7.00	.....	46.02
36	50⅜	36	55½	29	33⅞	10	1,000	4,600	Devoe & Rayn. A	No	95,000	2.00	.....	3.82
89½	99½	86⅝	103⅞	80	95⅞	32⅜	71,600	182,800	DuPont de Nemours	20	10,871,997	3.15	3.63	2.93
130	130	126⅞	128½	115	117	97½	3,200	10,100	6% cum. deb.	100	1,092,699	6.00	42.73	35.58
119¾	123⅛	110½	116⅛	79	89¾	46	20,300	51,300	Eastman Kodak	No	2,250,921	4.00	.....	4.76
155	155	141	147	120	130	110	530	1,980	6% cum. pfd.	100	61,657	6.00	.....	180.34
22⅞	26	17¼	50⅜	21½	49⅜	16⅛	21,200	52,900	Freeport Texas	10	784,664	2.00	1.76	3.01
114	120⅛	114	160⅛	113½	160⅛	97	500	1,100	6% conv. pfd.	100	25,000	6.00	120.08	156.73
26½	27⅞	23⅜	28⅜	15⅝	20	3¾	22,500	44,400	Glidden Co.	No	603,304	.90	.....	1.54
106⅞	108	104⅞	107½	83	91½	48	630	1,420	Glidden, 6% pfd.	100	63,044	7.00	.....	22.60
92¼	94½	85	96⅞	74	85⅞	65	4,100	13,100	Hazel Atlas	25	434,409	5.00	5.21	6.22
71	77⅝	71	81⅝	59	68⅝	15	4,600	13,700	Hercules Powder	No	582,679	3.00	3.94	2.79
124⅜	125	122	125¾	111	110⅛	85	280	1,310	7% cum. pfd.	100	105,765	7.00	28.79	22.38
24½	33	24⅜	32	19⅜	85	24	44,400	155,700	Industrial Rayon	No	600,000	1.68	2.23	3.01
3¼	5	2¾	6⅛	2	5⅞	⅞	8,100	34,600	Intern. Agricul.	No	436,049	None	.....	p .69
34¾	42¾	31	37¼	15	23½	5	1,600	14,000	7% cum. pr. pfd.	100	100,000	None	.....	p4.00
24¼	24½	22¼	29¼	21	23¼	6¾	129,200	334,900	Intern. Nickel	No	14,584,025	.60	1.14	.53
29	31⅛	29	32	21	27¾	13¾	1,600	4,600	Intern. Salt	No	240,000	1.50	2.02	2.04
33	36	33	33⅛	15¾	22	7½	3,300	13,800	Kellogg (Spencer)	No	500,000	1.60	.....	v3.01
22⅛	32¾	21½	43⅞	22½	37⅜	4⅜	50,500	150,400	Libbey Owens Ford	No	2,559,042	1.20	1.25	1.64
27¾	30⅞	24½	35⅜	16⅛	50	10¼	12,000	38,100	Liquid Carbonic	No	342,406	1.25	.....	v1.05
26	32	23¾	40¾	23½	46⅝	14	14,800	66,500	Mathieson Alkali	No	650,436	1.50	1.20	1.70
59	60½	55	61⅝	39	83	25	11,900	35,200	Monsanto Chem.	10	864,000	1.25	3.03	2.57
151	168½	145	170	135	140	43¼	700	3,900	National Lead	100	309,831	5.00	8.38	6.98
158⅝	158⅝	150	146½	122	128¼	101	500	1,040	7% cum. "A" pfd	100	243,676	7.00	20.12	18.35
131	131	121⅝	121½	100½	109⅛	75	130	840	6% cum. "B" pfd.	100	103,277	6.00	35.36	30.45
5½	8	4⅜	13	5½	11¾	1⅜	11,300	25,000	Newport Industries	1	519,347	None	.31	.05
83¾	90¾	80	94	60	96¾	31½	10,800	29,200	Owens-Illinois Glass	25	1,200,000	4.00	5.41	4.86
45¾	49⅝	42⅜	44⅜	33⅛	47½	19⅝	27,100	95,800	Procter & Gamble	No	6,410,000	1.70	.....	p 2.11
118	120½	115	117	102½	110¾	97	490	1,600	5% pfd. (ser. 2-1-29)	100	171,569	5.00	.....	p73.15
4¼	5½	4	6¾	3⅛	7¼	1⅜	3,400	21,100	Tenn. Corp.	5	857,896	None	.....	— .11
30	36¾	29½	43¼	30	45¼	15¼	37,400	98,800	Texas Gulf Sulphur	No	2,540,000	2.00	.....	2.93
46⅛	49	44	50⅞	35⅞	51⅞	19¾	67,700	197,700	Union Carbide & Carbon	No	9,000,743	1.60	2.28	1.59
51⅛	53¼	46	50⅜	35	37¾	10¼	20,500	56,300	United Carbon	No	370,127	2.40	3.55	1.39
38¼	45½	35⅛	64¾	32	94	13½	16,000	46,500	U. S. Indus. Alco.	No	391,033	None	.....	3.56
14½	21¾	13⅝	31¾	14	36¼	7⅝	16,800	50,100	Vanadium Corp.-Amer.	No	366,637	None	—2.29	—2.40
3	4⅝	2½	5⅜	1⅞	7⅜	⅝	6,300	32,500	Virginia-Caro. Chem.	No	486,000	None	.....	p—2.46
19¾	27¼	18	26	10	26½	3⅜	6,000	51,200	6% cum. part. pfd.	100	213,392	None	.....	p .52
96½	100	85	84	59¾	63½	35⅜	200	2,700	7% cum. prior pfd.	100	60,000	None	.....	p9.06
19	23½	16¾	27¼	14⅞	20½	5	2,000	16,700	Westvaco Chlorine	No	284,962	.40	1.55	1.08
NEW YORK CURB EXCHANGE														
16¼	17⅛	15	22½	14⅝	16½	3¼	27,300	124,700	Amer. Cyanamid "B"	No	2,404,194	m .10	.99	.99
2	3⅛	2	4⅛	2⅜	4½	1	500	2,700	British Celanese Am. R.	243	....	None	.....	.....
9⅝	110	93	105¼	81	110	27	1,275	10,450	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	16.37	32.24
102	105	97½	102	83	90	51	600	2,500	7% cum. prior pfd.	100	113,668	7.00	28.13	47.98
10½	15	10	19	7	26⅞	2	500	3,150	Celluloid Corp.	15	194,952	None	—1.67	—1.00
11⅝	12⅜	11⅝	14⅜	10½	11⅝	4⅛	300	4,800	Courtaulds' Ltd.	1 £	24,000,000	4½ %	.....	.....
83¾	92	80½	91	67½	78	30	6,600	18,900	Dow Chemical	No	945,000	2.00	.....	†3.60
10⅝	12½	8¾	10¾	4	8	½	6,700	16,700	Duval Texas Sulphur	No	500,000	None	.....	z .08
41	43	37	40¾	19	19	8	2,000	5,800	Heyden Chem. Corp.	10	147,600	1.35	.....	2.68
47¼	58	47¼	57½	39	39⅞	13	6,600	22,550	Pittsburgh Plate Glass	25	2,141,305	1.40	2.69	1.87
85	90¼	84	90½	47¼	47	12⅞	10,425	27,100	Sherwin Williams	25	635,583	3.00	.....	y3.54
111½	113½	108	109¾	100	99	80	1,010	1,420	6% pfd. AA. cum.	100	155,521	6.00	.....	y20.78
CLEVELAND STOCK EXCHANGE														
85	90½	85	91	67½	78	30	17	867	Dow Chemical	No	945,000	2.00	.....	†3.60
PHILADELPHIA STOCK EXCHANGE														
70⅝	79	70⅜	75	50¼	57	25¼	225	575	Pennsylvania Salt	50	150,000	3.00	.....	2.17

Last	1935 March High	1935 March Low	1934 High	1934 Low	1933 High	1933 Low	Sales March 1935	Sales 1935	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
105⅝	107½	104½	106¾	83⅞	89	64	398,000	1,227,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
8⅝	11	7⅜	17¾	5	14⅛	2⅛	86,000	317,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
83⅝	87½	77⅝	88	61½	74⅞	37	63,000	253,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
95¾	99¾	91⅛	92	62	65	38½	95,000	514,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
7½	10⅜	7	19½	5⅛	14⅞	2½	435,000	1,030,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
89	93½	89	98½	89⅞	99⅛	87	38,000	242,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
36	38	35	74½	34½	62	33¾	5,000	12,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
94¾	96	91½	90	65½	76	50	43,000	115,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
84	94¼	83	89½	62	81	34¾	82,000	656,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE													
103½	104	102⅛	104⅝	101⅜	103½	101	3,000	57,000	Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

† Year ended 5-31-34; m Last paid, no regular rate; p Year ended 6-30-34; v Year ended 9-1-34; y Year ended 8-31-34; z Year ended 8-31-34;
* Including extras.

Industrial Trends

¶ *Business Again Shows Signs of Advancing After Several Weeks of Hesitancy—Situation Complicated by Legislative Uncertainties—*

The hesitancy that manifested itself in the last week in February continued through most of March. In the last week definite signs of resumption of the forward movement again appeared. Despite the somewhat pessimistic attitude in many quarters, the volume of business easily equaled, if not bettered, the March, '34, statistics.

Retail trade fell under the figure for March of last year, probably by about 5-15%. This was due to the late Easter period for '35 and April totals are expected to run as high as 25-30% above the corresponding period of last year. Wholesale business has been very satisfactory.

The automotive field presents the brightest picture of all. In the last week of the month production reached 100,000 units for the first time since July, '30, and the month's total is expected to be very close to the 400,000 mark. Estimates for the sale of cars for '35 have now been revised upward to 4,000,000.

Steel activity declined somewhat at a time when it is usually advancing. Nevertheless, the rate is higher than in the same period of last year. Freight car loadings are disappointing, failing to show improvement over '34 totals. Electrical consumption, on the other hand, remains well ahead. Lumber production is in good volume, and coal mining is at an unseasonably high figure, due to the fear of a strike. Bank clearings are larger.

Paint sales are showing a very promising seasonal advance and are ahead of last year by a rather wide margin. The lacquer, solvent, and electroplating industries report very satisfactory business in the automotive and rubber centers. Sale of raw paint materials is in good volume. Shoe and tanning industries are rather quiet, but activity in glass is at a high rate. Paper production is holding up fairly well. While building figures are extremely disappointing so far this year and indicate that a very high percentage of the total is Government inspired, there is now increasing evidence that private building is about to open up. The next 60 days is expected to show tangible results in the home modernization and renovation plans of the administration.

Wholesale prices were generally weaker last month and the commodity markets, with but very few exceptions, report net losses. This was due to the uncertainty over policies for the control of cotton, the unsettled state of legislative affairs in Washington, war threats in Europe and currency weaknesses in European countries, notably Belgium. The *N. Y. Times* Index of Business Activity stood at 86.2 on Mar. 23, compared with 87.5 on Feb. 23. Mar. 2 it stood at 85.5 so that March really shows a net gain. On Mar. 24, '34, the Index was 84.0.

While 3 out of 4 of the basic textile industries have ended one of their most disastrous quarters in years, improvement is expected shortly and it is hoped that by the time half year figures are released that they will be close to '34. Cotton, of course, has been the one hit most badly. Along with improvement in volume, textile executives are hoping for better prices for all 4 items.

Consumption of chemicals was at a slightly slower pace in March, but because of the additional days the total just about equaled that for the shorter month of February. As the month closed indications seemed to point to a higher rate in April. Prices continue stable. Oils and fats were generally lower, following the downward trend in the commodity markets generally.

Favorable business factors can be summarized as follows: automotive production continues to increase; electric power is at a high level; business failures are declining; life insurance sales are close to 20% above last year; the farmer is buying; private financing is showing signs of revival; and industrial employment is well sustained. The unfavorable factors are: a declining rate in steel activity; freight car loadings running below last year; extremely low figures in the construction field; the recent break in cotton prices and in other commodity markets; uncertain outlook in new legislative bills; and the war clouds and international currency uncertainty.

As the first quarter ends there is naturally some disappointment that the rate of business activity has not kept pace with the rate during the sharp rise from last September to January. But it must be remembered that in the last 3 months business has been subjected to a long series of uncertainties and despite these has managed to register improvement. First, it was the gold clause decision, in the last 30 days, the framing of a new NRA. It is felt that the next 60 days should clear many of the present uncertainties. Business is ready to transact business if the raps for order can only be heard above the din.

Statistics of Business

	February 1935	February 1934	January 1935	January 1934	December 1934	December 1933
Auto production	304,544	231,707	292,765	156,907	185,919	80,565
Bldg. contracts*‡	$75,083	$96,716	$99,773	$186,463	$212,813	$278,030
Failures, Dun & Bradstreet	1,005	1,049	1,184	1,364	963	1,132
Merchandise imports‡	......	......	$167,006	$135,706	$132,252	$133,518
Merchandise exports‡	......	......	$176,223	$172,221	$170,676	$192,638
Newsprint Production						
Canada, tons	180,305	174,447	201,959	188,374	239,544	175,304
U. S., tons	70,805	72,402	80,666	84,194	79,777	80,895
Newfoundland, tons	24,604	22,038	28,012	25,477	24,394	......
Total, tons	277,457	246,849	312,703	299,278	345,535	......
Plate glass prod., sq. ft.	13,723,151	7,441,278	13,365,188	7,607,195	8,389,975	......
Shoe production, pairs	......	......	......	26,041,782	23,199,708	......
Steel ingots	2,742,125	2,183,160	2,576,671	1,971,187	1,941,000	1,798,000
Steel activity, % of capacity	51.61	41.31	47.67	33.16	35.26	33.10
U. S. consumption crude rubber, tons	43,187	40,609	47,103	39,284	36,662	28,757
Tire shipments	......	......	3,622,615	......	3,108,552	3,531,121
Tire production	......	......	4,626,472	......	3,778,418	3,081,886
Tire inventory	......	......	10,397,667	......	9,454,985	8,888,070
Dept. of Labor Indices						
Factory payrolls, totals†	......	......	64.1	63.2	64.0	54.3
Factory employment†	......	......	80.4	75.1	78.1	74.4
Chemical price index†	86.5	78.8	84.5	78.8	82.2	79.2
Chemical employment†a	......	......	108 3	107.9	108.8	107.6
Chemical payrolls†a	......	......	91.5	84.5	91.7	84.9
Chemicals and Related Products						
Exports‡	......	......	$7,326	......	$8,478	......
Imports‡	......	......	6,596	......	$4,437	......
Stocks, mfd. goods†	......	......	118	126	117	121
Stocks, raw materials†	......	......	107	117	117	126
Pig Iron production, tons	1,608,552	1,263,673	1,477,336	1,215,226	1,027,622	1,182,079

Week Ending	Carloadings 1935	Carloadings 1934	Carloadings % of Change	Electrical Output§ 1935	Electrical Output§ 1934	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices: Metals	Fats & Oils	Chem. & Drugs	Mixed Fert.	Fert. Mat.	All Groups	Labor Dept. Chem. & Drug Price Index	% Steel Activity	Fisher's Index Purch. Power	N. Y. Times Index Bus. Act.
Mar. 2	604,642	605,717	—0.2	1,734,338	1,658,040	+4.6	79.7	81.6	82.2	94.0	76.1	65.5	77.9	81.6	48.2	122 0	85.5
Mar. 9	587,270	614,120	—4.4	1,724,131	1,647,024	+4.7	79.6	81.7	79.1	94.0	76.1	65.4	77.9	81.6	47.1	122.2	85.6
Mar. 16	597,432	627,549	—4.8	1,728,323	1,650 013	+4.7	78.4	81.6	77.8	94.0	76.1	65.2	77.5	81.5	46.8	122.4	86.1
Mar. 23	607,780	610,036	—0.4	1,724,763	1,658,389	+4.0	77.1	81.6	76.1	94.0	76.1	65.3	76.8	81.5	46.1	....	86.2

* 37 states, F. W. Dodge Corp.; ‡ 000 omitted; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; *a* Includes all allied products but not petroleum refining; § k.w.h., 000 omitted.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizers and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1934 Average $1.31. - Jan. 1934 $1.37 - March 1935 $1.24

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Acetaldehyde, drs c-l, wks lb.	...	.14	...	.14	.14	.16½
Acetaldol, 95%, 50 gal drs wks ....lb.	.21	.25	.21	.25	.21	.31
Acetamide, tech, lcl, kegs..lb.	.38	.43	.38	.43	.40	1.35
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys ....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech, drs ....lb.	.22	.24	.22	.24	.22	.32
Acetone, tks, delv ....lb.	.11	.12	.11	.12	.10	.12
drs, c-l, delv ....lb.	...	.12	...	.12	.12	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls ....lb.	.06¾	.07	.06¾	.07	.06	.07
Acetic, 28%, 400 lb bbls, c-l, wks ....100 lbs.	...	2.40	...	2.40	2.40	2.91
glacial, bbls, c-l, wks 100 lbs.	...	8.25	...	8.25	8.25	10.02
glacial, USP, bbls, c-l, wks ....100 lbs.	...	12.25	...	12.25	...	12.25
Adipic, kgs, bbls ....lb.	...	.72	...	.72	.72	.72
Anthranilic, refd, bbls ....lb.	.85	.95	.85	.95	.85	.95
tech, bbls ....lb.	...	.75	...	.75	.65	.75
Battery, cbys, delv ..100 lbs.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb kgs ..lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs ....lb.	.54	.59	.54	.59	...	...
Boric, tech, gran, 80 tons, bgs, delv ....ton *a*	..	80.00	...	80.00	80.00	80.00
Broenner's, bbls ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 95%, cbys ....lb.	.53	.60	.53	.60	.53	.85
edible, c-l, wks, cbys ...lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs ....lb.	...	.22	...	.22	.22	.22
wks ....lb.	...	.23	...	.23	.23	.23
tks, wks ....lb.	...	.21	...	.21	.21	.21
Camphoric, drs ....lb.	...	5.25	...	5.25	5.25	5.25
Chicago, bbls. ....lb.	...	2.10	...	2.10	2.10	2.10
Chlorosulfonic, 1500 lb drs, wks ....lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99¾%, drs, delv lb.	.13¾	.15¾	.13¾	.15¾	.13½	.15¾
Citric, USP, crys, 230 lb bbls ....lb. *b*	.28	.29	.28	.29	.28	.30
anhyd, gran, drs ....lb. *b*	...	.31	...	.31	.31	.31
Cleve's, 250 lb bbls ....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal.	.46	.47	.46	.47	.46	.47
99%, straw, LB, drs, wks, frt equal ....gal.	.64	.65	.64	.65	.64	.65
resin grade, drs, wks, frt equal ....gal.	.54	.55	.54	.55	.54	.55
Crotonic, drs ....lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs ..lb.	.11	.13	.11	.13	.11	.13
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs. ....lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls ....lb.	.65	.68	.65	.68	.60	.70
USP, bbls ....lb.	.70	.80	.70	.80	.74	.80
Gamma, 225 lb bbls, wks...lb.	.77	.79	.77	.79	.77	.79
H, 225 lb. bbls, wks ....lb.	.50	.55	.50	.55	.50	.70
Hydriodic, USP, 10% sol. cbys ....lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks ....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks ....lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks ....lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks ....lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls ....lb.	.04½	.05	.04½	.05	.04	.05
22%, light refd, bbls ..lb.	.06½	.07	.06½	.07	.06½	.07
44%, light, 500 lb bbls ..lb.	.11½	.12	.11½	.12	.11½	.12
44%, dark, 500 lb bbls ..lb.	.09½	.10	.09½	.10	.09	.10
USP X, 95%, cbys ....lb.	.45	.50	.45	.50	...	...
USP VIII, 75%, cbys ..lb.	.43	.48	.43	.48	...	...
Laurent's, 250 lb bbls ....lb.	.36	.37	.36	.37	.36	.37
Linoleic, bbls ....lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs ....lb.	.29	.32	.29	.32	.25	.32
Malic, powd, kgs ....lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks ......N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.01
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls ....lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Muriatic, 18°, 120 lb cbys, c-l, wks ....100 lb.	...	1.35	...	1.35	...	1.35
tks, wks ....100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks ..100 lb.	...	1.45	...	1.45	...	1.45
tks, wks ....100 lb.	...	1.20	...	1.20	...	1.20
22°, c-l, cbys, wks ..100 lb.	...	1.95	...	1.95	...	1.95
tks, wks ....100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys ....lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls ....lb.	.85	.87	.85	.87	.85	.87
Naphthenic, drs ....lb.	.12	.13	.12	.13	.10	.13
Naphthionic, tech, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys. c-l, wks ....100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks..100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks..100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks..100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. ....lb.	.11½	.12½	.11½	.12½	.11½	.12⅛
Phosphoric, 50%, USP, cbys ....lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks..lb.	.06	.08	.06	.08	.05	.08
75%, acid, c-l, drs, wks..lb.	.09	.10½	.09	.10½	.07	.10½
Picramic, 300 lb bbls, wks.lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks ....lb.	.30	.40	.30	.40	.30	.50
Pyrogallic, crys, kgs, wks..lb.	1.55	1.65	1.55	1.65	1.40	1.65
Salicylic, tech, 125 lb bbls, wks ....lb.	...	.40	...	.40	.33	.40
Sebacic, tech, drs, wks ....lb.	...	.58	...	.58	...	.58
Sulfanilic, 250 lb bbls, wks lb.	.18	.19	.18	.19	.18	.19
Sulfuric, 60°, tks, wks ...ton	...	11.00	...	11.00	...	11.00
c-l, cbys, wks ....100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks ....ton	...	15.50	...	15.50	15.00	15.50
c-l, cbys, wks ....100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks ....lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ....ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls ....lb.	...	.24	.24	.25	.25	.26
Tobias, 250 lb bbls........lb.	.75	.80	.75	.80	.75	.80
Trichloroacetic bottles.....lb.	2.45	2.75	2.45	2.75	2.00	2.75
kgs ....lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls ....lb.	1.50	1.60	1.50	1.60	1.35	1.70
Vanadic, drs, wks ....lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls ....lb.	.45	.53	.45	.53	.35	.53
dark, bbls ....lb.	.12	.17	.12	.17	.10	.17
egg, edible ....lb.	.85	.87	.85	.87	.82	.92
vegetable, edible ....lb.	.65	.70	.65	.70	.65	.70
ALCOHOLS						
Alcohol, Amyl, tks, delv...lb.	...	.143	...	.143	...	.143
c-l, drs, delv ....lb.	...	.15	...	.15	.15	.157
Amyl, secondary, tks, delv ....lb.	...	.108	...	.108	...	.108
c-l, drs, delv ....lb.	...	.118	...	.118	...	.118
Amyl, tertiary, taks, delv lb	...	.052	...	.052	...	.052
c-l, drs, delv ....lb.	...	.062	...	.062	...	.062
Benzyl, bottles ....lb.	.65	1.10	.65	1.10	.75	1.10
Butyl, normal, tks, delv lb. *d*	...	.12	...	.12	.09½	.12
c-l, drs, delv ....lb. *d*	...	.13	...	.13	.10½	.13
Butyl, secondary, tks, delv ....lb. *d*	...	.096	...	.096	.076	.096
c-l, drs, delv ....lb. *d*	...	.106	...	.106	.086	1.06
Capryl, drs, tech, wks ..lb.	...	.85	...	.85	.85	.85
Cinnamic, bottles ....lb.	3.25	3.65	3.25	3.65	3.25	3.65
Denatured, No. 5, c-l, drs, wks ....gal. *e*	...	.35½	.34	.35½	.30	.34
Western schedule, c-l, wks ....gal. *e*	...	.39½	.38	.39½	...	...
Denatured, No. 1, tks, wks ....gal. *e*	...	.31	.29½	.31	.29½	.304
c-l, drs, wks ....gal. *e*	...	.36	.34½	.36	...	...
Western schedule, tks, wks ....gal. *e*	...	.35	.32½	.35	...	...
c-l, drs, wks ....gal. *e*	...	.40	.37½	.40	...	...
Diacetone, tech, tks, delv ....lb. *f*	...	.16	...	.16	...	...
c-l, drs, delv ....lb. *f*	...	.17	...	.17	...	.17

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Alcohols (continued)						
Ethyl, 190 proof, molasses, tks ....gal. g	...	4.10	4.08½	4.10	...	4.08½
c-l, drs ....gal. g	4.17	4.27	4.13½	4.27	..	4.13½
c-l, bbls ....gal. g	4.18	4.28	4.15½	4.28	4.12½	4.24½
absolute, drs ....gal. g	4.57½	6.11½	4.55½	6.11½	...	...
Furfuryl, tech, 500 lb, drs ....lb.	...	.35	...	.35	.35	.40
Hexyl, secondary tks, delv lb.	...	.11½	...	.11½	...	.11½
c-l, drs, delv ....lb.	...	.12½	...	.12½	...	.12½
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	4.00	4.50	4.00	4.50	4.00	4.50
Isobutyl, refd, lcl, drs . lb.	...	.12	.12	.60	.60	.75
c-l, drs ....lb.	...	.11½	...	...	...	...
tks ....lb.	...	.10½	...	...	...	...
Isopropyl, refd, c-l, drs..lb.	...	.55	...	.55	.45	.55
Propyl, norm, 50 gal drs gal.	...	.75	...	.75	...	.75
Special Solvent, tks, wks gal.	...	.32	...	...	...	...
Western points, tks, wks ....gal.	...	.35	...	...	...	...
Aldehyde ammonia, 100 gal drs ....lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb bbls ....lb.	.60	.65	.60	.65	.65	.70
Alphanaphthylamine, 350 lb bbls .... lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.00	...	3.00	2.90	3.00
25 bbls or more, wks ....100 lb.	...	3.15	...	3.15	...	3.15
less than 25 bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Granular, c-l, bbls, wks 100 lb.	...	2.75	...	2.75	...	2.75
25 bbls or more, wks 100 lb.	...	2.90	...	2.90	...	2.90
Powd, c-l, bbls, wks 100 lb.	...	3.15	...	3.15	...	3.15
25 bbls or more, wks 100 lb.	...	3.30	...	3.30	...	3.30
Chrome, bbls ....100 lb.	7.00	7.25	7.00	7.25	6.50	7.25
Potash, lump, c-l, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
25 bbls or more, wks 100 lb.	...	3.40	...	3.40	...	3.40
Granular, c-l, bbls, wks 100 lb.	...	3.40	...	3.00	...	3.00
25 bbls or more, bbls, wks ....100 lb.	...	3.00	...	3.15	...	3.15
Powd, c-l, bbls, wks 100 lb.	...	3.40	...	3.40	...	3.40
25 bbls or more, wks 100 lb.	...	3.55	...	3.55	...	3.55
Soda, bbls, wks ....100 lb.	4.00	4.15	4.00	4.15	3.50	4.15
Aluminum metal, c-l NY ....100 lb.	20.00	23.30	20.00	23.30	20.00	24.30
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%, wks ....lb.	.07	.12	.07	.12	.07	.12
93%, wks ....lb.	.05	.08	.05	.08	.04	.08
Crystals, c-l, drs, wks ...lb.	.06½	.07	.06½	.07	.06½	.01
Solution, drs, wks ....lb.	.03	.03½	.03	.03½	.03	.03½
Hydrate, 96%, light, 90 lb. bbls, delv ....lb.	.13	.15	.13	.15	.13	.16½
heavy, bbls, wks ....lb.	.04	.04½	.04	.04½	.04	.04½
Oleate, drs ....lb.	...	.15¾	...	.15¾	...	.15¾
Palmitate, bbls ....lb.	.21	.22	.20	.22	.19	.21
Resinate, pp., bbls ....lb.	...	.15	...	.15	.12½	.15
Stearate, 100 lb bbls....lb.	.18	.20	.17	.20	.17	.18
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.35	...	1.35	1.35	1.35
c-l, bbls, wks ....100 lb.	...	1.55	...	1.55	1.55	1.55
Sulfate, iron-free, c-l, bgs, wks ....100 lb.	...	1.90	...	1.90	1.90	1.90
c-l, bbls, wks ....100 lb.	...	2.05	...	2.05	2.05	2.05
Aminoazobenzene, 110 lb kgs ....lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks..lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.21½	.15¼	.21½	.15¼	.21½
26°, 800 lb drs, delv ....lb.	.02½	.03	.02½	.03	.02½	.03
Aqua 26° tks NH ....cont.	...	.05	...	.05	...	.05
tk wagon ....lb.	...	.024	...	.024	...	...
Ammonium Acetate, kgs ..lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b. plant ....100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls..lb.	.15	.17	.15	.17	.15	.17
carbonate, tech, 500 lb bbls ....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb bbls, wks ....100 lb	4.45	4.90	4.45	4.90	4.45	5.25
Gray, 250 lb bbls wks..lb.	5.00	5.75	5.00	5.75	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10	.11
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Linoleate ....lb.	.11	.12	.11	.12	.11	.12
Nitrate, tech, cks ....lb.	.04	.05	.04	.05	.03¾	.05
Oleate, drs ....lb.	...	.10	...	.10	...	.10
Oxalate, neut, cryst, powd, bbls ....lb.	.26	.27	.26	.27	.26	.27
pure, cryst, bbls, kgs..lb.	.27	.28	.27	.28	.27	.28
Serchlorate, kgs ....lb.	...	.16	...	.16	.16	.16
Persulfate, 112 lb kgs ..lb.	.22½	.25	.22½	.25	.20	.25
Phosphate, dibasic tech, powd, 325 lb bbls ....lb.	.08	.10	.08	.10	.08	.11½
Sulfate, dom, f.o.b., bulk.ton	...	24.00	...	24.00	22.00	25.00
200 lb bgs ....ton	...	25.80	...	25.80	...	25.80
100 lb bgs ....lb.	...	26.50	...	26.50	...	26.50
Sulfocyanide, kgs ....lb.	...	.50	...	.50	...	.50
Amyl Acetate (from pentane) tks delv ....lb.	...	.13½	...	.13½	...	.13½
tech, drs, delv ....lb.	.142	.149	.142	.149	.142	.149
secondary, tks, delv ..lb.	...	.108	...	.108	.09	.108
c-l, drs, delv ....lb.	.118	.123	.118	.123	...	.123
Alcohol, see Alcohol, Amyl, also Fusel Oil.						
Amyl Chloride, norm drs, wks lb.	.56	.68	.56	.68	.56	.68
Chloride, mixed, drs, wks ....lb.	.07	.077	.07	.077	.07	12.2
tks, wks ....lb.	...	.06	...	.06	.06	10.5
Lactate, drs, wks ....lb.	...	.50	...	.50	...	.50
Mercaptan, drs, wks ....lb.	...	1.10	...	1.10	...	1.10
Stearate, drs, wks ....lb.	...	.31	...	.31	...	.31
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.10	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine ....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% ....lb.	...	.75	...	.75	...	.75
40% ....lb.	...	.18	...	.18	...	.18
Anthraquinone, sublimed, 125 lb bbls ....lb.	.50	.52	.50	.52	.45	.50
Antimony, metal slabs, ton lots ....lb.	...	.14½	...	.14½	.07	.14½
Needle, powd, bbls ....lb.	.07¾	.08¼	.07¾	.08¼	.07	.09
Butter of, see Chloride.						
Chloride, soln cbys ....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls .... lb.	.11¼	.12¼	.10¼	.12¼	.08	.11
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.22	.24
Sulfuret, golden, bbls ..lb.	.19	.23	.19	.23	.16	.23
Vermilion, bbls ....lb.	.35	.42	.35	.42	.35	.42
Archil, conc, 600 lb bbls ..lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Triple, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Arglos, 80%, casks ....lb.	.15	.16	.15	.16	.15	.16
Crude, 30%, casks ....lb.	.07	.08	.07	.08	.07	.09
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl ....lb.	.08¾	.09	.08¾	.09¾	.08¾	.09¼
Arsenic, Red, 224 lb cs kgs lb.	...	.15¾	...	.15¾	.14	.15¾
White, 112 lb kgs ....lb.	.03½	.04½	.03½	.04½	.03½	.05
Metal ....lb.	.40	.42	.40	.42	.40	.45
Asbestine, c-l wks ....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate precip, 200 lb bgs, wks ....ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat (witherite) 90% gr, c-l, wks, bgs .... ton	42.00	45.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs NY lb.	.14	.16	.14	.16	.14	.16
Chloride, 600 lb bbl wks ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.13
Hydrate, 500 lb bbls ....lb.	.05½	.06	.05½	.06	.04¾	.06
Nitrate, 700 lb cks ....lb.	...	.08¼	...	.08¼	...	.08¼
Barytes, floated, 350 lb bbls wks ....ton	23.00	30.50	23.00	30.50	23.00	30.50
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	5.00	10.00
Benzaldehyde, tech, 945 lb drs, wks ....lb.	.60	.62	.60	.62	.60	.65
Benzene (Benzol), 90%, Ind, 8000 gal tks, frt allowed ....gal.	...	.15	...	.15	.15	.20½
90% c-l, drs ....gal.	...	.24	...	.24	...	.24
Ind Pure, tks, frt allowed ....gal.	...	.15	...	.15	.15	.20½
Benzidine Base, dry, 250 lb bbls ....lb.	.67	.69	.67	.69	.67	.69
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs..lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl, wks ....lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.53	.55	.53	.55	.53	.58
Bismuth metal	1.10	1.20	1.10	1.20	1.10	1.30
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	...	...
Hydroxide, boxes ....lb.	3.15	3.20	3.15	3.20	...	...
Oxychloride, boxes ....lb.	2.95	3.00	2.95	3.00	...	...
Subbenzoate, boxes ....lb.	3.25	3.30	3.25	3.30	...	...
Subcarbonate, kgs ....lb.	1.55	1.65	1.55	1.70	...	...
Trioxide, powd, boxes ..lb.	3.45	3.50	3.45	3.50	...	...
Subnitrate	1.40	1.45	1.40	1.45	1.40	1.60
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks ....ton h	42.50	70.00	42.50	70.00	42.50	70.00
Bleaching Powder, 800 lb drs c-l wks contract...100 lb.	...	1.90	...	1.90	...	1.90
lcl, drs, wks ....lb.	2.15	3.50	2.15	3.50	2.00	3.50
Blood, dried, f.o.b., NY..unit	...	3.25	2.75	3.25	2.40	3.25
Chicago, high grade ...unit	...	3.25	3.25	3.75	2.00	3.10
Imported shipt ....unit	...	2.90	2.90	3.10	2.75	3.20
Blues, Bronze Chinese Milori Prussian Soluble ....lb.	.36½	.38	.36½	.38	.35½	.38
Bone, 4½ + 50% raw, Chicago ....ton	19.00	20.00	19.00	20.00	19.00	25.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ....lb.	.05½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp..ton	...	24.00	23.00	24.00	16.00	24.00
Domestic, bgs, Chicago..ton	16.50	17.00	16.00	18.00	...	...
Borax, tech, gran, 80 ton lots, sacks, delv ....ton i	...	36.00	...	36.00	36.00	36.00
bbls, delv ....ton i	...	46.00	...	46.00	46.00	46.00
c-l, sacks, delv ....ton i	...	40.00	...	40.00	40.00	40.00
c-l, bbls, delv ....ton i	...	50.00	...	50.00	50.00	50.00
Tech, powd, 80 ton lots, sacks ....ton i	...	41.00	...	41.00	41.00	41.00
bbls, delv ....ton i	...	51.00	...	51.00	51.00	51.00
c-l, sacks, delv ....ton i	...	45.00	...	45.00	45.00	45.00
c-l, bbls, delv ....ton i	...	55.00	...	55.00	55.00	55.00
Bordeaux Mixture, jobbers, East, c-l, tins, drs, cases lb.	.08	.16	.08	.16	...	.16
Jobbers, West, c-l ....lb.	.08	.10	.08	.10	...	.10
Dealers, East, c-l ....lb.	.08½	.16½	.08½	.16½	...	.16½
Dealers, West, c-l ....lb.	.09	.11	.09	.11	...	.11

g Grain alcohol 20c a gal. higher in each case.

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case.

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Bromine, cases ....lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk ....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks ....lb.	...	.04	...	.04	.02¾	.04
Butyl, Acetate, norm drs, frt allowed ....lb.	.13	.13½	.13	.13½	.11	.14
tks, frt allowed ....lb.	.12	.13	.12	.13	.10	.13
Secondary tks, frt allowed lb.	..	.096	...	.096	.08	.096
drs, frt, allowed ......lb.	.106	.111	.106	.111	...	.111
Aldehyde, 50 gal drs wks lbs.	.19	.21	.19	.21	.19	.36
Secondary, drs ....lb.	.60	.75	.60	.75	.60	.75
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Furoate, tech, 50 gal drs lb.	...	.65	...	.65	.60	.65
Lactate drs ....lb.	.22½	.23½	.22½	.23½	.22½	.29
Propionate, drs ....lb.	.18	.18½	.18	.18½	.17	.22
tks, delv ....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	...	.26	...	.26	.25	.26
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes...lb.	.75	.85	.75	.85	.65	.85
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	2.00	...	2.00	2.00	3.00
Arsenate, jobbers, East of Rocky Mts, drs ......lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06¼	.07½	.06¼	.07½	...	...
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06½	.06¾	.06¼	.06¾	...	...
Carbide, drs ....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs c-l wks ....ton	...	19.50	...	19.50	...	19.50
Solid, 650 lb drs c-l f.o.b. wks ....ton	...	17.50	...	17.50	...	17.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.17	...	.17	...	.17
Furoate, tech, 100 lb drs lb.	...	.25	...	.25	.25	.30
Gluconate, tech, 125 lb bbls ....lb.	...	.28	...	.28	.25	.28
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls ....lb.	.21	.22	.20	.22	.19	.20
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls....lb.	.18	.20	.17	.20	.17	.19
Camphor, slabs ....lb.	.50	.52	.50	.52	.51	.59
Powder ....lb.	.50	.52	.50	.52	.51	.59
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	.06½	.07
cartons, delv ......lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv ....lb.	...	.08¼	...	.08¼	...	.08¼
Bisulfide, 500 lb drs....lb.	.05¼	.08	.05¼	.08	.05½	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv ....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom grd lb.	.12½	.14	.09½	.15	..09¼	.13
80-100 mesh, c-l, bgs ....lb.	.13	.16	.10	.16	.10	.14
Castor Pomace, 5½ NH_3, cl, bgs, wks ....ton	...	18.00	18.00	18.50	...	...
Imported, ship, bgs ....ton	...	18.75	18.75	20.00	...	...
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.13	.18
Transparent, cs ....lb.	...	.20	...	.20	.16	.20
Cellulose, Acetate, 50 lb kgs ....lb.	.55	.60	.55	.60	.55	.90
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks ....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	.12	.18
Willow, powd, 100 lb bbl wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv ... .ton	25.00	30.00	25.00	30.00	...	...
Chestnut, clarified bbls wks lb.	...	.01⅞	...	.01⅞	.01⅝	.01⅞
25% tks wks ....lb	...	.01½	...	.01½	.01¼	.01½
Pwd, 60%, 100 lb bgs, wks ....lb	..	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	7.00	9.00
Powdered, bbls ....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks ...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks contract ....lb.	.07½	.08½	.07½	.08½	.07	.08½
cyls, c-l, contract .. lb. *j*	...	.05½	...	.05½	...	.05½
Liq tk wks contract..100 lb.	...	2.00	...	2.00	1.85	2.00
Multi c-l cyls wks cont..lb.	2.15	2.40	2.15	2.40	2.00	2.40
Chloroacetophenone, tins, wks ....lb.	...	2.00	...	2.00	...	...
Chlorobenzene, Mono, 100 lb drs, lc-l, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ....lb.	.30	.31	.30	.31	.30	.35
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	1.25
Chrome, Green, CP ......lb.	.20	.30	.20	.30	.20	.30
Commercial ....lb.	.06¼	.10	.06¼	.10	.06¼	.10
Yellow ....lb.	.14	.16	.14	.16	.15	.16
Chromium, Acetate, 8% Chrome bbls ....lb.	.05	.05¾	.05	.05¾	.05	.05¾
20° soln, 400 lb bbls ...lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price.

Current

Coal Tar
Diphenylguanidine

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Coal tar, bbls ....bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls ......lb.	...	.60	...	.60	.60	.80
Carbonate tech, bbls ....lb.	1.35	1.40	1.35	1.40	1.34	1.40
Hydrate, bbls ....lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ...lb.	...	.30	...	.30	.30	.40
Resinate, fused, bbls ...lb.	...	.12½	...	.12½	...	.12½
Precipitated, bbls ......lb.	...	.32	...	.32	.32	.42
Cobalt Oxide, black, bgs ..lb.	1.25	1.35	1.25	1.35	1.25	1.35
Cochineal, gray or bk bgs lb.	.34	.39	.34	.39	.33	.42
Teneriffe silver, bgs ....lb.	.35	.40	.35	.40	.34	.43
Copper, metal, electrol 100 lb.	...	9.00	...	9.00	7.87½	9.00
Carbonate, 400 lb bbls ..lb.	...	.08¼	...	.08¼	...	.08¼
52-54% bbls ....lb.	.14½	.16¼	.14½	.16¼	.15½	.16
Chloride, 250 lb bbls ...lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs ....lb.	.37	.38	.37	.38	.37	.40
Oleate, precip, bbls .....lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls ..lb.	.15	.17	.15	.17	.12½	.17
black bbls, wks ......lb.	.14½	.15	.14	.16½	...	...
Resinate, precip, bbls ...lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls ...lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-l wks 100 lb.	...	3.85	...	3.85	3.75	3.85
Copperas, crys and sugar bulk c-l, wks, bgs ....ton	12.00	13.00	12.00	13.00	12.00	14.50
Corn Syrup, 42 deg, bbls ....100 lb.	...	3.49	...	3.49	3.04	3.59
43 deg, bbls ......100 lb.	...	3.54	...	3.54	3.09	3.64
Corn Sugar, tanners, bbls ....100 lbs.	...	3.46	3.46	3.56	...	...
Cotton, Soluble, wet, 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls .....lb.	...	.16¾	.16¼	.17¼	.17½	.19½
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ......gal.	.11½	.12½	.11½	.12½	.10	.12½
Grade 2 ....gal.	.10½	.11½	.10½	.11½	.10½	.12
Cresol, USP, drs ....lb.	.11	.11½	.11	.11½	.11	.11½
Crotonaldehyde, 98% 50 gal drs ....lb.	.32	.36	.32	.36	.26	.36
Cudbear, English ....lb.	.19	.25	.19	.25	.19	.25
Philippine, 100 lb bale ..lb.	.03¾	.04¾	.03½	.04¾	.03½	.04¾
Cyanamid, bags c-l frt allowed Ammonia unit	...	1.07½	...	1.07½	...	1.07½
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	3.95	4.15	3.95	4.15	3.50	4.20
British Gum, bgs ...100 lb.	4.20	4.50	4.20	4.50	3.75	4.60
White, 140 lb bgs ..100 lb.	3.90	4.10	3.90	4.10	3.47	4.20
Potato, Yellow, 220 lb bgs ....lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl ...lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ....lb.	...	.08	.08	.08¾	.06¾	.08¾
Diamylamine, drs, wks ....lb.	...	1.00	...	1.00	...	1.00
Diamylene, drs, wks ......lb.	.095	.102	.095	.102	.09	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.09	.77
tks, wks ....lb.	...	.075	...	.075	...	...
Diamylphthalate, drs wks gal.	.18	.19½	.18	.20½	...	.20½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls ....lb.	2.25	2.45	2.25	2.45	2.35	2.45
Dibutylphthalate, drs, wks lb.	.20	.21	.20	.23	.20½	.21
Dibutyltartrate, 50 gal drs lb.	.29½	.31½	.29½	.31½	.29½	.31½
Dichlorethylene, drs .....gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks ....lb.	.16	.17	.16	.17	.16	.21
tks, wks ....lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	.15	.23	...	.15
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.0278	.040
tks, wks ....lb.	...	.02½	...	.02½	...	.02½
Diethylamine, 400 lb drs ..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs .....lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅜	.35	.31⅜	.35	.31⅜	.35
90% grade, drs ......lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs..lb.	.52	.55	.52	.55	.52	.55
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs ....lb.	.18½	.19	.18½	.27	.26	.27
Diethylsulfate, tech, 50 gal drs ....lb.	...	...	...	...	...	...
Diethyleneglycol, drs .....lb.	.15½	.17½	.15½	.17½	.14	.16
Mono ethyl ethers, drs..lb.	.15	.17	.15	.17	.15	.17
tks, wks ....lb.	...	.15	...	.15	...	...
Mono butyl ether, drs ..lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs ....lb.	.26	.27	.26	.27	.26	.27
Diglycol Oleate, bbls .....lb.	.16	.24	.16	.24	.16	.18
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	...	.95	...	.95	.95	1.20
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.29	.30
Dimethyl Ethyl Carbinol, drs ....lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs ...lb.	.20	.21½	.20½	.24½	.24	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls ....lb. *k*	.17	.19½	.17	.19½	.17	.19½
Dintrochlorobenzene, 400 lb bbls ....lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15½	.16½
Diphenyl ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.31	.32	.31	.34
Diphenylguanidine, 100 lb bbl ....lb.	.36	.37	.36	.37	.36	.37

k Higher price is for purified material.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt. ton	36.00	40.00	36.00	40.00	35.00	40.00
Extract lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb. cases lb.	...	.56	.46	.56	.40	.54
Epsom Salt, tech, 300 lb bbls c-l NY 100 lb.	1.80	2.00	1.80	2.25	2.20	2.25
USP, c-l, bbls 100 lb.	...	2.00	2.00	2.25	2.25	2.25
Ether, USP anaesthesia 55 lb drs lb.	.22	.23	.22	.23	.22	.24
(Conc) lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed lb.	...	.06	..	.06	...	...
Nitrous, conc, bottles lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester						
tks lb.	.07½	.08	.07½	.08	.07½	.08
drs lb.	.08½	.09	.08½	.09	.08½	.09
Anhydrous, tks lb.	...	.08½	...	.08½	.08½	.10
drs lb.	.09½	.10	.09½	.10	.09½	.10¼
Acetoacetate, 50 gal drs lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drs lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys lb.	...	.30	...	.30	...	.30
Crotonate, drs lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks lb.	.25	.29	.25	.29	.25	.33
Methyl Ketone, 50 gal drs, frt allowed lb.	.08½	.09	.08½	.09	.08½	.09
tks, frt allowed lb.	...	.07½	...	.07½	...	...
Oxalate, drs, wks lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb drs lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drs lb.	.0545	.0994	.0545	.0994	.0545	.09
Glycol, 50 gal drs, wks lb.	.26	.28	.26	.28	.26	.28
Mono Butyl Ether, drs, wks	.20	.21	.20	.21	.20	.21
tks, wks lb.	...	.19	...	.19	.19	.19
Mono Ethyl Ether, drs, wks	.16	.17	.16	.17	.15	.17
tks, wks lb	...	.15	...	.15	.15	.15
Mono Ethyl Ether Acetate, drs, wks	.17½	.18½	.17½	.18½	.16½	.18½
tks, wks lb.	...	.16½	...	.16½	.16½	.16½
Mono, Methyl Ether, drs lb	.21	.23	.21	.23	.21	.23
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl lb.	...	.75	...	.75	...	.75
Ethylidenaniline lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks ton	14.00	14.50	14.00	14.50	13.50	14.50
Ferric Chloride, tech, crys, 475 lb bbls lb.	.05	.07½	.05	.07½	.05	.07½
sol, cbys lb.	.06¼	.06½	.06¼	.06½	...	...
Fish Scrap, dried, unground, wks unit *l*	...	2.50	...	2.50	2.25	2.60
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	...	2.00	...	2.00	2.00	2.50
Fluorspar, 98%, bgs	28.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb bbls, wks lb.	.06	.07	.06	.07	.06	.07
Fossil Flour lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes lb.	.16	.18	.16	.18	.16	.18
Sticks ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls lb.	.42	.43	.42	.43	.42	.43
Gall Extract lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs lb.	...	.06	.05	.08	.04	.08
Singapore cubes, 150 lb bgs 100 lb.	.08	.09	.07⅛	.09⅛	.05	.09⅛
Gelatin, tech, 100 lb cs lb.	.50	.55	.50	.55	.45	.55
Glauber's Salt, tech, c-l wks 100 lb.	1.10	1.30	1.10	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glucose (grape sugar) dry 70-80° bgs, c-l, NY 100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb. bgs 100 lb.	...	2.33	...	2.33	...	2.33
Glue, bone, com grades, c-l bgs lb.	...	.08	...	.08	.07	.12½
Better grades, c-l, bgs lb.	.09	.09½	.09	.09½	.09½	.16
Casein, kgs lb.	.18	.22	.18	.22	.18	.22
Hide, high grd, c-l, bgs lb.	.23	.28	.23	.28	.23	.28
Med grd, c-l, bgs lb.	.19	.23	.19	.23	.19	.23
Low grd, c-l, bgs lb.	.13½	.19	.13½	.19	.13½	.19
Glycerin, CP, 550 lb drs lb.	.14	.14½	.14	.14½	.11	.14½
Dynamite, 100 lb drs lb.	.13¾	.14¼	.13¾	.14¼	.10	.14¼
Saponification, drs lb.	.10	.10½	.10	.10½	.06¾	.10½
Soap Lye, drs lb.	.09	.09¼	.09	.09¼	.06¼	.09⅛

l + 10; *m* + 50.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Glyceryl Phthalate ....lb.	...	.28	...	.28	...	.28
Glyceryl Stearate, bbls....lb.	...	.18	...	.18	...	.18
Glycol Phthallate ....lb.	...	.29	.28	.29	...	.28
Glycol Stearate ....lb.	...	.23	.18	.23	.18	.20
Graphite,						
Crystalline, 500 lb bbls ....lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls .....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls ....lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes ....lb.	.87	.90	.87	.90	.85	.90
Animi (Zanzibar) bean & pea, 250 lb cases ....lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases ....lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts ......lb.	.11½	.14	.09½	.14	.07¾	.10⅝
White sorts, No. 1, bgs ....lb.	.21	.22	.21	.22	...	...
No. 2, bgs ....lb.	.19	.20	.19	.21	...	...
Powd, bbls ....lb.	.15½	.16½	.13½	.16½	...	...
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY ....lb.	.02½	.10½	.02½	.10½	.02½	.10½
Egyptian, 200 lb cases, f.o.b. NY ....lb.	.12	.15	.12	.15	.12	.15
California, f.o.b. NY, drs ....ton	29.00	55.00	29.00	55.00	...	...
Benzoin Sumatra, USP, 120 lb cases ....lb.	.24	.25	.20	.28	.18½	.23
Copal Congo, 112 lb bgs, clean, opaque ....lb.	.21¾	.22¼	.21¾	.24⅝	.24⅛	.28
Dark, amber ....lb.	.08⅜	.08⅞	.08⅜	.09¼	.08⅝	.10½
Light, amber ....lb.	.12½	.13	.12	.14⅞	.14⅜	.19
Copal, East India 180 lb bgs						
Macassar pale bold ....lb.	.09⅞	.10⅜	.09⅞	.10⅜	.09⅞	.10½
Chips ....lb.	.05½	.06	.05½	.06	...	...
Nubs ....lb.	.08½	.09	.08½	.09	...	...
Dust ....lb.	.04	.04½	.03¾	.04½	...	...
Singapore						
Bold ....lb.	.16	.16½	.16	.17	.16	.17
Chips ....lb.	.04⅝	.05⅛	.04⅝	.05⅛	...	...
Nubs ....lb.	.10	.10½	.10	.11	...	...
Dust ....lb.	.04	.04½	.03¾	.04½	...	...
Copal Manilla, 180-190 lb baskets, Loba A .....lb.	.11¾	.12¼	.11¾	.12¼	.11⅜	.14½
Loba B ....lb.	.10¼	.10¾	.10¼	.10¾	.10¼	.13½
Loba C ....lb.	.10⅛	.11⅜	.10⅛	.11⅜	.09¾	.12
MA sorts ....lb.	.06	.06½	.06	.07¼	.06½	.07½
DBB ....lb.	.08¼	.08¾	.08	.08¼	.08	.09½
Dust ....lb.	.04⅞	.05⅜	.04⅞	.05⅜	...	...
Copal Pontianak, 224 lb cases, bold genuine ....lb.	.14⅜	.14⅞	.14⅜	.16⅝	.16⅛	.19
Mixed ....lb.	.12⅞	.13⅜	.12⅞	.14½	...	...
Chips ....lb.	.06⅞	.07¾	.06⅞	.07⅞	...	...
Nubs ....lb.	.09⅝	.10⅛	.09⅝	.10¾	...	...
Split ....lb.	.12⅞	.13⅜	.13⅞	.13⅜	...	...
Dammar Batavia, 136 lb cases						
A ....lb.	.19	.19½	.19	.20¼	...	...
B ....lb.	.18	.18½	.18	.19¼	...	...
C ....lb.	.16	.16½	.16	.17¼	...	...
D ....lb.	.12¼	.12¾	.11¾	.12¾	...	...
A/D ....lb.	.14¼	.14⅝	.14	.14⅝	...	...
A/E ....lb.	.12	.12½	.11¾	.12½	...	...
E ....lb.	.06¾	.07¼	.07	.07¼	.07	.09½
F ....lb.	.06½	.06⅝	.06⅛	.06⅝	.05½	.06⅝
Singapore						
No. 1 ....lb.	.16	.16¾	.16	.17	.15½	.18
No. 2 ....lb.	.11⅛	.11⅝	.10¾	.11⅝	.09⅜	.11
No. 3 ....lb.	.04⅝	.05⅝	.04⅝	.05⅝	.05⅛	.07
Chips ....lb.	.08⅞	.09¾	.08⅞	.09¾	.09	.10¼
Dust ....lb.	.06¼	.06¾	...	05¾	.05	.06
Seeds ....lb.	.06¼	.06¾	.06¼	.07¼	.06	.07¾
Ester ....lb.	.07⅝	.08⅜	.07¼	.08⅜	...	...
Gamboge, pipe, cases .....lb.	.57	.58	.57	.65	.57	.65
Powdered, bbls ....lb.	.65	.70	.65	.75	.67	.75
Ghatti, sol. bgs ....lb.	.11	.15	.09	.15	.09	.09½
Karaya, pow bbls xxx ....lb.	.24	.25	.23	.25	.23	.25
xx ....lb.	.16	.17	.15	.17	.15	.16
No. 1 ....lb.	.08	.09	.08	.09	.08	.11
No. 2 ....lb.	.07	.08	.07	.08	.07	.09
Kauri, NY, San Francisco,						
Brown XXX, cases ....lb.	.60	.60½	.60	.60½	...	...
BX ....lb.	.33	.33½	.33	.33½	...	...
B1 ....lb.	.19	.19½	.19	.19½	...	...
B2 ....lb.	.14½	.15	.14½	.15	...	...
B3 ....lb.	.12	.12½	.12	.12½	...	...
Pale XXX ....lb.	.65	.65½	.65	.65½	...	...
No. 1 ....lb.	.40	.40½	.40	.40½	...	...
No. 2 ....lb.	.22	.22½	.22	.22½	...	...
No. 3 ....lb.	.15	.15½	.15	.15½	...	...
Kino, tins ....lb.	.70	.80	.70	.80	.75	.80
Mastic ....lb.	.52	.52½	.46	.52½	.35	.55½
Sandarac, prime quality, 200 lb bgs & 300 lb cks ...lb.	.32½	.33	.32½	.35½	.35	.50
Senegal, picked bgs ......lb.	.20	.21	.20	.21	17	.21
Sorts ....lb.	.11½	.12½	.09⅜	.12½	.08	.10
Thus, bbls ....280 lbs.	...	11.00	10.50	11.00	9.50	10.75
Strained ....280 lbs.	...	11.00	10.50	11.00	9.50	10.75
Tragacanth, No. 1, cases ....lb.	1.15	1.20	1.15	1.20	1.00	1.20
No. 2 ....lb.	1.05	1.10	1.05	1.10	...	...
No. 3 ....lb.	.95	1.00	.95	1.00	...	...
No. 4 ....lb.	.85	.90	.85	.90	...	...
No. 5 ....lb.	.75	.80	.75	.80	...	...
No. 6, bgs ....lb.	.14	.15	.14	.15	...	...
Sorts, bgs ....lb.	.11	.12	.11	.12	...	...
Yacca, bgs ....lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.04

	Current Market		1935		1934	
			Low	High	Low	High
Helium, cyl. (200 cu. ft.) cyl.	...	25.00	...	25.00	25.00	25.00
Hematite crystals, 400 lb						
bbls ....lb.	.16	.18	.16	.18	.16	.18
Paste, 500 bbls ....lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb bbls						
wks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.04½
tks ....lb.	...	.02½	...	.02½	...	...
Hexalene, 50 gal drs wks..lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C.						
Group 3, tks ....gal.	...	.14	...	.14	...	.14
Hexamethylenetetramine,						
drs ....lb.	.37	.39	.37	.39	.37	.39
Hexyl Acetate, delv drs ...lb.	.12	.12½	.12	.12½	.12	.12½
tks ....lb.	...	.11½	...	.11½	...	...
Hoof Meal, f.o.b. Chicago unit	...	2.50	2.50	2.70	1.85	2.70
South Amer. to arrive unit	...	1.85	...	1.85	1.65	1.80
Hydrogen Peroxide, 100 vol,						
140 lb cbys ....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride						
......................lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo Madras, bbls ......lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs ....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ....lb.	...	.12	...	.12	...	.12
Iodine, crude ....per kilo	...	15s 1d	...	15s 1d	...	15s 1d
Resublimed, kgs ....lb.	...	1.90	...	1.90	1.90	2.30
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.07	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.14	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English ....lb.	.07½	.08¾	.07½	.08¾	.07½	.09
Isobutyl Carbinol (128-132°C)						
drs, wks ....lb.	.33	.34	.33	.34	.34	.34
tks, wks ....lb.	...	.32	...	.32	.32	.326
Isopropyl Acetate, tks ....lb.	...	.07½	...	.07½	.07	.07½
drs, frt allowed ....lb.	.08½	.09	.08½	.09	...	...
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY,						
Brown ....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken,						
f.o.b. NY, bbls ....lb.	...	.09½	...	.09½	.09½	.09½
White, broken, bbls ....lb.	...	.11	...	.11	.11	.11
cryst bbls ....lb.	...	.10½	...	.10½	.10½	.10½
gran, bbls ....lb.	...	.11	...	.11	.11	.11
powd, bbls ....lb.	...	.11¼	...	.11¼	.11¼	.11¼
Arsenate, East, jobbers,						
drs ....lb.	.09	.09½	.09	.09½	...	...
Dealers, drs ....lb.	.09¼	.10½	.09¼	.10½	...	...
West, jobbers, drs .....lb.	...	.09	...	.09	...	...
dealers, drs ....lb.	...	.10	...	.10	...	...
Linoleate, solid bbls ......lb.	.26	.26½	.26	.26½	.26	.26½
Metal, c-l, NY ....100 lb	...	3.65	3.50	3.70	3.50	4.25
Red, dry, 95% Pb_2O_4,						
delv ....lb.	.0615	.07	.06	.07	.06	.07¾
97% Pb_2O_4, delv .....lb.	.064	.07¼	.06¼	.07¼	...	...
98% Pb_2O_4, delv ....lb.	.0665	.07½	.06½	.07½	...	...
Nitrate, 500 lb bbls, wks..lb.	.10	.14	.10	.14	.10	..14
Oleate, bbls ....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	.14	.18½
Stearate, bbls ....lb.	.22	.23	.22	.23	.22	.23
White, 500 lb bbls, wks..lb.	.06½	.07	.06½	.07	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06	...	.06	...	.06
Lime, chemical quicklime,						
f.o.b., wks, bulk .....ton	7.00	7.25	7.00	7.25	...	...
Hydrated, f.o.b., wks ..ton	8.50	12.00	8.50	12.00	...	...
Lime Salts, see Calcium Salts.						
Lime sulfur, sol, jobbers,						
tks ....gal.	...	.10	...	.10	...	...
drs ....gal.	.13½	.15½	.13½	.15½	...	...
Dealers, tks ....gal.	...	.10½	...	.10½	...	...
drs ....gal.	.14	.16½	.14	.16½	...	...
Linseed cake, bgs ....ton	...	29.50	29.50	37.50	21.50	37.50
Linseed Meal, bgs ....ton	...	29.50	29.50	40.00	30.50	41.00
Litharge, coml, delv, bbls..lb.	.0515	.06	.05	.06	.051	.06¾
Lithopone, dom, ordinary,						
delv, bgs ....lb.	.04½	.04¾	.04½	.04¾	.04½	.04¾
bbls ....lb.	.04¾	.05	.04¾	.05	.04¾	.05
High strength, bgs .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Titanated, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.08½	.10½	.08½	.10½	.08½	.12½
Solid, 50 lb boxes ......lb.	.13½	.17½	.13½	.17½	.13½	.17½
Sticks ....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	55.00	65.00
Magnesium Carb, tech, 70 lb						
bgs, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs, c-l.						
wks ....ton	36.00	39.00	36.00	39.00	34.00	39.00
Magnesium fluosilicate, crys,						
400 lb bbls, wks .... lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb.						
bbls ....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls ...lb.	...	.50	...	.50	...	.50
Palmitate, bbls ....lb.	.23	.24	.22	.24	.21	.23
Stearate, bbls ....lb.	.20	.22	.19	.22	...	...
Linoleate, lig drs ......lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls ....lb.	...	.12	...	.12	.11½	.12½
Manganese Borate, 30%, 200						
lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.07	.12
Dioxide, tech (peroxide),						
drs ....lb.	.03¾	.06	.03¾	.06	.03¾	.06
Mangrove 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African ....ton	..	29.50	29.00	30.00	26.00	32.00
Marble Flour, blk ....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride ....lb.	.71	.76	.71	.93	.73	.93

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Mercury metal ... 76 lb. flasks	...	73.50	...	73.50	66.50	79.00
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls ....lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls .....lb.	.09	.10	.09	.10	.09	.11
Stearate, bbls ....lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb bbls ....lb.	.67	.69	.67	.69	.67	.69
Methanol, 95%, frt allowed, drs ....gal. *o*	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed ....gal. *o*	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal. *o*	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed ....gal. *o*	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. *o*	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed, drs ....gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. *o*	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-100%. drs ....lb.	.18	.18½	.18	.18½	.18	.18½
Synthetic, 410 lb drs ...lb.	.16	.17	.16	.17	.16	.17
tks ....lb.	...	.15	...	.15	.15	.15
Acetone, frt allowed, drs ....gal. *p*	.49½	.68½	.49½	.73½	...	...
tks, frt allowed, drs gal. *p*	.44	...	.44	.52½	...	...
Synthetic, frt allowed, east of Rocky M., drs gal. *p*	.57½	.60	.57½	.60	.57½	.60
tks, frt allowed	...	.53	...	.53	...	...
West of Rocky M., frt allowed, drs ....gal. *p*	.60	.63	.60	.63	...	...
tks, frt allowed ..gal. *p*	...	.56	...	.56	...	...
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	.60	1.20
Anthraquinone ....lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	.10½	.10½
Chloride, 90 lb cyl .....lb.	...	.45	...	.45	.45	.45
Ethyl Ketone, tks ......lb.	...	.07½	...	.07½	.07½	.07½
Propyl carbinol, drs ...lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks ..lb.	35.00	...	35.00	...	...	...
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY ....gal.	.08	.08¼	.07¾	.08¼	.06	.09
Monoamylamine, drs, wks lb.	...	1.00	...	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.						
Monomethylparaminosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls..lb.	...	.04¼	...	.04¼	.03¾	.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs ....ton	...	23.50	23.50	27.00	24.50	32.00
J2 bgs ....ton	...	15.00	15.00	15.75	15.75	18.00
R2 bgs ....ton	16.00	16.50	16.00	16.50	16.25	18.00
Naphtha. v.m. & p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ....gal.	...	.30	.26	.30	.26	.30
drs, c-l ....gal.	...	.35	.31	.35	.31	.35
Naphthalene, dom, crude, bgs, wks ....lb.	1.65	2.40	1.65	2.40	...	...
Imported, cif, bgs ....lb.	...	1.90	...	1.90	1.75	1.90
Dyestuffs, bgs, bbls, Eastern wks ....lb.	.04¼	.04¾	.04¼	.04¾	...	...
Balls, ref'd, bbls, Eastern wks ....lb.	.04½	.05¼	.04½	.05¼	...	...
Flakes, ref'd, bbls, Eastern wks ....lb.	.04½	.05¼	.04½	.05¼	...	...
Dyestuffs, bgs, bbls, Mid-West wks ....lb. *q*	.04¾	.05¼	.04¾	.05¼	...	...
Balls, ref'd, bbls, Mid-West wks ....lb. *q*	.05	.05¾	.05	.05¾	...	...
Flakes, ref'd, bbls, Mid-West wks ....lb. *q*	.05	.05¾	.05	.05¾	...	...
Nickel Chloride, bbls .....lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY..lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY ...lb.	.12½	.13	.12½	.13	.11½	.13
Single, 400 lb bbls, NY lb.	.11½	.12	.11½	.12	.11½	.12
Metal ingot ....lb.	...	.35	...	.35	.35	.35
Nicotine, free 50%, 8 lb tins, cases	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs ......lb.	.77	.80	.67	.80	.67	.75
Nitre Cake, blk ....ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks ....lb.	.09	.11	.09	.11	.09	.11
tks ....lb.	...	.08½	...	.08½	...	.08½
Nitrocellulose, c-l-l cl, wks lb.	.27	.34	.27	.34	.27	.34
Nitrogenous Mat'l, bgs, imp unit	...	2.45	2.45	2.75	...	...
dom, Eastern wks ....unit	...	Nom.		Nom.	2.35	3.25
dom, Western wks ....unit	...	2.15	2.15	2.30	...	...
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs .....lb.	.19	.20	.19	.20	.18	.20
Chinese, bgs ....lb.	.19	.20	.19	.20	.17	.20
Oak Bark Extract, 25%, bbls lb.	...	.03½	...	.03½	.03⅜	.03½
tks ....lb.	...	.02¾	...	.02¾	...	...
Orange-Mineral, 1100 lb cks NY ....lb.	.09¼	.10	.09¼	.10	.09¼	.10½
Orthoaminophenol, 50 lb kgs. lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.82	.84	.82	.84	.82	1.15
Orthochlorophenol, drs ....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs ....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb drs ....lb.	.05½	.06	.05½	.06	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Orthonitrochlorobenzene, 1200 lb drs, wks .... lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks .... lb.	.07	.10	.05½	.10	.05½	.06
Orthonitrophenol, 350 lb drs .... lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l .... lb.	.14½	.15	.14½	.15	.14	.15
Orthonitroparachlorphenol, tins .... lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst ..... lb.	.17	.25	.17	.25	.16	.25
51 deg liquid .... lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs ...... lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs						
122-127 deg M P .... lb.	.04	.04¾	.04	.04¾	.04½	.04¾
128-132 deg M P .... lb.	.05	.0515	.05	.0515	.04¾	.0515
133-137 deg M P .... lb.	.0575	.06	.0575	.06	.05	.06
Para aldehyde, 110-55 gal drs .... lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs .... lb.	...	.85	...	.85	.52	.85
Aminohydrochloride, 100 lb kgs .... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	.78	1.05
Chlorophenol, drs ...... lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs .. lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr .... gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene 150 lb bbls wks .... lb.	.16	.20	.16	.20	.16	.20
Nitroacetanilid, 300 lb bbls .... lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks .... lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks .... lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls .... lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls .... lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.35	.37	.35	.37	.35	.37
Phenylenedamine, 350 lb bbls .... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs .... lb.	.32	.50	.32	.50	.32	.50
Toluenesulfonamide, 175 lb bbls .... lb.	.70	.75	.70	.75	.70	.75
tks, wks .... lbs.	...	.31	...	.31	...	...
Toluenesulfonchloride, 410 lb bbls, wks .... lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks .... lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kgs .... lb.	...	.24	...	.24	.23	.24
250 lb kgs .... lb.	...	.22	...	.22	...	.22
Perchlorethylene, 50 gal drs .... lb.	...	.15	...	.15	...	.15
Persian Berry Ext, bbls .. lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C, group 3 tks .... gal.	...	.09	...	.09	.09	.09
drs, group 3 .... gal.	.10	.15	.10	.15	...	...
Petrolatum, dark amber, bbls .... lb.	.02⅝	.02⅞	.02⅝	.02⅞	...	...
Light, bbls .... lb.	.02⅞	.03⅛	.02⅞	.03⅛	...	...
Medium, bbls .... lb.	.02¾	.03	.02¾	.03	...	...
Dark green, bbls .... lb.	.02½	.02¾	.02½	.02¾	...	...
White, lily, bbls .... lb.	.06⅜	.06½	.06⅜	.06½	...	...
White, snow, bbls ...... lb.	.07⅜	.07½	.07⅜	.07½	...	...
Red, bbls .... lb.	.02½	.02¾	.02½	.02¾	...	...
Petroleum Ether, 30-60°, group 3, tks .... gal.	...	.13	...	.13	.11	.13
drs, group 3 .... gal.	.15	.16	.15	.16	.15	.17

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Cleaners naphthas, group 3, tks, wks .... gal.	...	.06⅞	...	.06⅞	...	...
Bayonne, tks, wks .. gal.	...	.09	...	.09	...	...
West Coast, tks .... gal.	...	.15	...	.15	...	...
Hydrogenated naphthas, frt allowed East, tks ... gal.	...	.17½	...	.17½	...	...
No. 2, tks .... gal.	...	.22½	...	.22½	...	...
No. 3, tks .... gal.	...	.17½	...	.17½	...	...
No. 4, tks .... gal.	...	.22½	...	.22½	...	...
Lacquer diluents, tks, Bayonne .... gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks .... gal.	...	.07⅞	...	.07⅞	.06⅞	.08⅛
Naphtha, V.M.P., East, tks, wks .... gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ... gal.	...	.06⅞	...	.06⅞	.06¼	.07¼
Petroleum thinner, East, tks, wks .... gal.	...	.09	...	.09	.09	.09
Group 3, tks, wks ... gal.	...	.05⅞	...	.05⅞	.05⅞	.06⅜
Rubber Solvents, stand grd, East, tks, wks ...... gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks .. gal.	...	.06⅞	...	.06⅞	.06⅜	.06⅞
Stoddard Solvent, East, tks, wks .... gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ... gal.	...	.06⅜	...	.06⅜	.05¾	.07⅛
Phenol, 250-100 lb drs .... lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs .... lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .... lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride .... lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins .. lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins .... lb.	20.00	22.00	20.00	22.00	20.00	22.00

Current

Phosphate Rock
Rosin Oil

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Phosphate Rock, f.o b. mines						
Florida Pebble, 68% basis ....ton	...	3.25	...	3.25	2.85	3.25
70% basis ....ton	...	3.90	...	3.90	3.35	3.90
72% basis ....ton	...	4.40	...	4.40	3.85	4.40
75-74% basis ....ton	...	5.40	...	5.40	4.90	5.40
75% basis ....ton	...	5.50	...	5.50	5.05	5.50
77-80% basis ....ton	...	6.50	...	6.50	5.90	6.50
Tennessee, 72% basis ..ton	...	4.75	...	4.75	4.75	5.00
Phosphorous Oxychloride 175 lb cyl ....lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ......lb.	.44	.45	.44	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.48	.50	.48	.50	.48	.62
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks ....gal.	...	.59	...	.59	...	...
Straw color, bbls ......gal.	...	.59	...	.59	...	...
tks ....gal.	...	.54	...	.54	...	...
Pitch Hardwood, wks ....ton	...	15.00	15.00	20.00	...	20.00
Burgundy, dom, bbls, wks ....lb.	...	.03½	...	.03½	...	...
Imported ....lb.	.11	.13	.11	.13	...	...
Coaltar, bbls, wks .....ton	...	19.00	...	19.00	...	...
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	3.75	4.25	3.75	4.25	...	...
Stearin, drs ....lb.	.03	.04½	.03	.04½	...	...
Platinum, refd ....oz.	35.00	36.00	35.00	36.00	35.00	38.00

POTASH

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.07⅜
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.08¼
Liquid tks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.03⅝
Potash Salts, Rough Kainit 14% basis ....ton	...	8.50	...	8.50	8.50	9.70
Manure Salts, imported						
20% basis, blk ....ton	...	8.60	...	8.60	8.60	12.00
30% basis, blk ....ton	...	12.90	...	12.90	12.90	19.15
Domestic, cif ports, blk unit	...	.43	...	.43	...	...
Potassium Acetate ....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis bgs ....ton	...	22.00	...	22.00	22.00	37.15
Dom, blk ....unit	...	.40	...	.40	...	...
Pot & Mag Sulfate, 48% basis bgs ....ton	...	22.50	...	22.50	22.50	25.00
Potassium Sulfate, 90% basis bgs ....ton	...	35.00	...	35.00	35.00	42.15
Potassium Bicarbonate, USP 320 lb bbls ....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb cks ....lb.	.08⅛	.08⅝	.08⅛	.08⅝	.08⅛	.08⅝
Binoxalate, 300 lb bbls..lb.	.22	.23	.22	.23	.14	.23
Bisulfate, 100 lb kgs ..lb.	.35	.36	.35	.36	.33	.36
Carbonate, 80-85% calc 800 lb cks ....lb.	.07½	.07⅞	.07½	.07⅞	.07	.07⅞
liquid, tks ....lb.	...	...	...	...	...	...
drs, wks ....lb.	...	...	...	...	...	...
Chlorate crys, powd, 112 lb kgs, wks ....lb.	...	.09¾	...	.09¾	.08⅓	.09¾
gran, kgs ....lb.	.12	.13	.12	.13	...	...
powd, kgs ....lb.	.08¾	.09¾	.08¾	.09¾	...	...
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.60
Iodide, 75 lb bbls ......lb.	...	1.40	...	1.40	1.40	2.70
Metabisulfite, 300 lb bbls lb.	...	.15	...	.15	.10½	.15
Oxalate, bbls ....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, cks, wks ...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18⅓	.19½	.18½	.19½
Prussiate, red, 112 lb kgs lb.	.35	.38½	.35	.38½	.35	.39
Yellow, 500 lb casks ..lb.	.18	.19	.18	.19	.18	.19
Tartrate Neut, 100 lb kgs lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls ....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks	...	.07	...	.07	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls ....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs ......lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs .....100 lb.	...	2.75	...	2.75	2.25	2.75
Linseed Oil, kgs ...100 lb.	...	4.50	...	4.50	4.00	4.50
Pyridine, 50 gal drs .....gal.	...	1.25	...	1.25	...	1.25
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins ....lb.	2.75	3.00	2.75	3.00	2.75	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅝	...	.02⅝	.02¼	.02⅝
450 lb bbls, c-l ......lb.	...	.03⅛	...	.03⅛	.02¾	.03⅛
Solid, 63%, 100 lb bales cif ....lb.	...	.03⅝	...	.03⅝	.02⅞	.03⅝
Clarified, 64%, bales..lb.	...	.03⅞	...	.03⅞	.03	.03⅞
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.06	.06½	.06	.06½	.05½	.06½
Solid, 100 lb boxes .....lb.	.10	.12	.10	.12	.09½	.13
R Salt, 250 lb bbls, wks ..lb.	.44	.45	.44	.45	.40	.45
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.65	.80
Rochelle Salt, cryst ......lb.	.14	.14½	.14	.15	.12½	.16
Powd, bbls ....lb.	.13	.13½	.13	.13½	...	...
Rosin Oil, bbls, first run gal.	...	.36	.36	.45	.45	.48
Second run ....gal.	...	.43	.43	.48	.48	.53
Third run, drs ....gal.	..	.50	.50	.60	...	...

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	4.75	4.75	5.25	4.50	5.75
D	...	5.05	5.05	5.25	4.60	5.85
E	...	5.25	5.25	5.45	4.80	6.50
F	...	5.50	5.35	5.90	5.00	6.75
G	...	5.60	5.45	5.95	5.05	6.75
H	...	5.60	5.50	5.97½	5.10	6.75
I	...	5.60	5.55	6.00	6.75	4.05
K	...	5.60	5.60	6.00	5.30	6.75
M	...	5.65	5.65	6.02½	5.45	6.80
N	...	6.22½	5.75	6.40	5.50	6.80
WG	...	6.75	6.05	6.87½	5.70	6.80
WW	...	7.50	6.40	7.55	5.90	6.85
Rosins, Gum, Savannah (280 lb unit):						
B	...	3.50	3.50	4.00	...	...
D	...	3.80	3.80	4.20	...	...
E	...	4.00	4.00	4.20	...	...
F	...	4.25	4.15	4.65	...	...
G	...	4.35	4.25	4.70	...	...
H	...	4.35	4.30	4.75	...	...
I	...	4.35	4.35	4.75	...	...
K	...	4.35	4.35	4.75	...	...
M	...	4.35	4.35	4.75	...	...
N	...	4.95	4.50	5.15	...	...
WG	...	5.35	4.80	5.60	...	...
WW	...	6.25	5.25	6.25	...	...
X	...	6.25	5.25	6.25	...	...
Rosins, Wood, wks (280 lb unit), FF	5.20	6.35	4.30	6.35	...	...
I	6.05	7.00	4.65	7.00	...	...
M	6.30	7.25	5.00	7.25	...	...
N	6.80	7.75	5.40	7.75	...	...
Rosin, Wood. c-l, FF grade, NY	...	5.20	5.10	5.30	5.10	6.13
Rotten Stone, bgs mines ..ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls ..lb.	.05	.07	.05	.07	.05	.07
Selected, bbls ....lb.	.08	.10	.08	.10	.08	.12
Powdered, bbls ....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02½	.03¾
Sal Soda, bbls, wks ..100 lb.	...	1.30	...	1.30	1.10	1.30
Salt Cake, 94-96%, c-l, wks ....ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome, c-l, wks ......ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls ......lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls ....lb.	.069	.07⅞	.069	.07⅞	...	...
Cryst, bbls ....lb.	.069	.08	.069	.08	...	...
Satin, White, 550 lb bbls ..lb.	...	.01½	...	.01½	...	.01½
Shellac, Bone dry, bbls ..lb. r	.20	.21	.20	.32	.26	.37
Garnet, bgs ....lb.	.17	.19	.17	.27	.26	.32
Superfine, bgs ....lb. s	.16	.18	.16	.28	.23	.31
T. N., bgs ....lb. s	.13	.15	.13	.25	...	...
Schaeffer's Salt, kgs ......lb.	.48	.50	.48	.50	.48	.50
Silver Nitrate, vials ......oz.	...	.42¼	.38	.42¼	.31⅞	.40½
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.25
blk ....100 lb.	...	1.05	..	1.05	...	1.05
paper bgs ....100 lb.	...	1.20	...	1.20	...	1.20
bbls ....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs ....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	..	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	.03	.08
Acetate, tech, 450 lb bbls, wks ....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs ....lb.	...	.64	...	.64	.50	.64
Arsenate, drs ....lb.	...	.10½	...	.10½	.07¾	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs .. lb.	.46	.48	.46	.48	.45	.48
Bicarb, 400 lb bbl, wks. 100 lb.	...	1.85	...	1.85	1.85	1.85
Bichromate, 500 lb cks, wks ....lb.	.06⅛	.06⅝	.06⅛	.06⅝	.06⅛	.06⅝
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	...	...
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech ....ton	13.60	16.50	13.60	16.50	11.40	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks ....lb.	.07¼	.08¼	.07¼	.08¼	.07¼	.09½
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.19	.20	.19	.21	.19½	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.40	3.00
Tech, reg cryst, 375 lb bbls, wks ......100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide ....lb.	...	2.40	...	2.40	2.40	3.50
Metanilate, 150 lb bbls ..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ....100 lb.	2.65	3.05	2.65	3.05	2.65	3.05
cryst, bbls, wks ..100 lb.	...	3.25	...	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.02½	...	.02½	...	.02½
Napthenate, drs ....lb.	...	.09	...	.09	.09	.13
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ....ton	...	24.80	...	24.80	24.80	26.30
100 lb bgs ....ton	...	25.50	...	25.50	25.50	27.00
Bulk ....ton	...	23.50	...	23.50	23.50	24.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

Current

Sodium Nitrite
Thiocarbanilid

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Sodium (continued)						
Nitrite, 500 lb bbls ....lb.	.07¼	.08	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls ..lb.	.18	.19	.18	.19	.18	.19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.20	...	2.20	2.10	2.40
bgs, wks ......100 lb.	...	2.00	...	2.00	...	...
tri-sodium, tech, 325 lb bbls, wks ......100 lb.	...	2.60	...	2.60	2.60	2.70
bgs, wks ......100 lb.	...	2.60	...	2.60	...	..
Picramate, 160 lb kgs ..lb.	.67	.69	.67	.69	.69	.72
Prussiate, Yellow, 350 lb bbl, wks ....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, anhyd, 100 lb bbls ....lb.	.102	.132	.102	.15	...	.15
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.04¼	.04½	.04¼	.04¾	.04¾	.06
Stannate, 100 lb drs ....lb.	.31½	.34	.31	.37	.33½	.37½
Stearate, bbls ....lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l, wks ....100 lb. ‡	1.30	1.55	1.25	2.35	2.20	2.85
Sulfide, 80% cryst, 440 lb bbls, wks ....lb.	...	.02¼	...	.02¼	.02¼	.02½
62% solid, 650 lb drs, c-l, wks ....lb.	...	.03	...	.03	...	.03
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.02½	.023	.02½	.02¼	.02½
Sulfocyanide, bbls .....lb.	.32	.42½	.32	.42½	.28	.42½
Tungstate, tech, crys, kgs ....lb.	...	.90	...	.90	.70	.90
Spruce Extract, ord, tks ..lb.	...	.01	...	.01	...	.01
Ordinary, bbls ....lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks ...lb.	...	.01⅝	...	.01⅝	...	.01⅜
Super spruce ext, bbls ..lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs ....100 lb.	3.36	3.46	3.36	3.56	2.81	3.76
Powd, 140 lb bgs ...100 lb.	3.46	3.56	3.46	3.66	2.71	3.66
Potato, 200 lb bgs ......lb.	.04½	.05½	.04½	.06	.05¼	.06
Imp, bgs ....lb.	.05¾	.06	.05¾	.06½	.06	.06½
Rice, 200 lb bbls ....lb.	...	.07¼	.07¼	.08½	.07½	.08½
Wheat, thick bgs ....lb.	...	.08¼	...	.08¼	.06¼	.08¼
Strontium carbonate, 600 lb. bbls, wks ....lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY ....lb.	.08¾	.09½	.08¾	.09½	.08¾	.11
Sulfur	...	...	...	...	...	..
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Superfine, bgs .....100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, red, 700 lb drs, wks ....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl lb.	.08½	.10	.08½	.10	.07	.10
Multiple units, wks ....lb.	...	.06½	...	.06½	...	...
tks, wks ....lb.	...	.04¾	...	.04¾	...	...
Refrigeration, cyl, wks ...lb.	...	.13	...	.13	...	...
Multiple units, wks ....lb.	...	.09¼	...	.09¼	...	...
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ......ton	59.00	62.00	...	60.00	58.00	75.00
dom, bgs, wks ....ton	...	35.00	...	35.00	...	...
Superphosphate, 16% bulk, wks ....ton	...	8.50	...	8.50	8.00	8.50
Run of pile ....ton	...	8.00	...	8.00	7.50	8.00
Talc, Crude, 100 lb bgs, NY ....ton	14.00	15.00	14.00	15.00	12.00	15.00
Refd, 100 lb bgs, NY ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bgs, NY ton	22.00	30.00	22.00	30.00	27.50	30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	70.00	75.00	70.00	75.00	70.00	75.00
Refd, white, bgs, NY ton	75.00	80.00	75.00	80.00	75.00	80.00
Tankage Grd, NY ....unit §	...	2.65	2.65	2.75	2.50	3.25
Ungrd ....unit §	...	2.50	2.40	2.50	2.00	2.75
Fert grade, f.o.b. Chicago ....unit §	...	2.50	2.50	2.60	1.80	2.40
South American cif..unit §	...	3.00	3.00	3.15	2.75	3.10
Tapioca Flour, high grade, bgs ....lb.	.0215	.05	.0215	.05	.0215	.05
Tar Acid Oil, 15%, drs gal.	.21	.22	.21	.22	.21	.22
25%, drs ....gal.	.23	.24	.23	.24	.23	.24
Tar, pine, delv, drs .....gal.	.25	.26	.25	.26	...	...
tks, delv ....gal.	...	.20	...	.20	...	...
Tartar Emetic, tech ......lb.	.22¾	.23	.22¾	.23	.23	.23
USP, bbls ....lb.	.28	.28½	.28	.28½	.27	.28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	...	...
tks .. ..lb.	.13	.14	.13	.14	...	...
Tetrachlorethane, 50 gal drs lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl lb.	.20	.25	.20	.25	.20	.25

‡ Bags 15c lower; § + 10.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Tin, crystals, 500 lb bbls, wks ....lb.	.36½	.37	.36	.38½	.30	.40½
Metal, NY ....lb.	...	.508	...	.508	.50⅞	.55⅛
Oxide, 300 lb bbls, wks lb.	.51	.53	.51	.58	.55	.60
Tetrachloride, 100 lb drs, wks ....lb.	...	.24¾	.24¾	.26	.25½	.28½
Titanium Dioxide, 300 lb bbls ....lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Calcium Pigment, bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks ....lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.85
Para, red, bbls ....lb.	...	.75	...	.75	.75	.80
Toluidine, bgs ....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks lb.	...	.40	...	.40	...	.40
Triamylamine, drs, wks ...lb.	...	1.25	...	1.25	1.00	1.25
Trichlorethylene, 50 gal drs lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs ....lb.	.35	.38	.35	.38	.35	.38
Tricresyl Phosphate, drs ..lb.	.21	.23	.21	.23	.19	.26
Triphenyl Guanidine ....lb.	.58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ....ton	27.50	30.00	27.50	30.00	...	...
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	12.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.52¼	.49¾	.55½	.46¼	.63½
Savannah, bbls ....gal.	...	.47¼	.45	.50¼	.41¼	.58½
Jacksonville, bbls ....gal.	...	.47½	.45	.50¼	.41¼	.58½
Wood Steam dist, bbls, c-l, NY ....gal.	...	.46	.45	.49	.41	.61
Urea, pure, 112 lb cases ..lb.	.15½	.17	.15½	.17	.15	.17
Fert grade, bgs c.i.f. ..ton	100.00	120.00	100.00	120.00	90.00	120.00
c.i.f. S.A. points ....ton	100.00	120.00	100.00	120.00	90.00	120.00
Urea Ammonia liq 55% NH_3, tks ....unit	...	.96	...	.96	...	.96
Valonia beard, 42%, tannin bgs ....ton	...	43.00	42.50	43.50	39.00	48.00
Cups, 32% tannin, bgs..ton	...	27.50	27.50	28.50	23.00	32.50
Mixture, bark, bgs ....ton	...	32.00	...	32.00	..	32.00
Vermillion, English, kgs ..lb.	1.56	1.70	1.56	1.70	1.41	1.73
Vinyl Chloride, 16 lb cyl ..lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bgs ....ton	...	30.00	29.25	32.00	29.50	34.00
Extract, 60°, tks, bbls ..lb.	...	.03¼	...	.03¼	.03⅛	.03⅞

WAXES

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Wax, Bayberry, bgs ....lb.	.22	.23	.22	.23	.25	.30
Bees, bleached, white 500 lb slabs, cases ....lb.	.33½	.34	.33½	.34	.32	.37
Yellow, African, bgs ..lb.	.21¾	.22½	.21	.22½	.16	.22
Brazilian, bgs ....lb.	.23	.24½	.22	.24½	...	...
Chilean, bgs ....lb.	.23	.24½	.22	.24½	...	...
Refined, 500 lb slabs, cases ....lb.	.27½	.28	.27½	.28	.21	.29
Candelilla, bgs ....lb.	.11	.12½	.10	.12½	.10¼	.14½
Carnauba, No. 1, yellow, bgs ....lb.	.38½	.39	.35	.40	.30	.40
No. 2, yellow, bgs ....lb.	.37½	.38	.34	.39	.34	.41
No. 2, N. C., bgs ....lb.	.31	.31½	.26½	.31½	.20	.29
No. 3, Chalky, bgs ...lb.	.27½	.28½	.21	.28½	...	...
No. 3, N. C., bgs ....lb.	.28½	.29	.22½	.29	.16¼	.25
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	...	...
Yellow, bgs ....lb.	.36	.38	.36	.38	...	...
Domestic, bgs ....lb.	.08	.11	.08	.11	...	...
Japan, 224 lb cases ....lb.	.07½	.07¾	.06	.07¾	.06	.07½
Montan, crude, bgs ....lb.	.10½	.11½	.10½	.11½	.10	.11
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.21	.22	.19	.22	.18	.20
Cakes, cases ....lb.	.22	.23	.20	.23	.19	.21
Whiting, 200 lb bgs, c-l, wks ....ton	...	12.00	...	12.00	...	...
Alba, bgs, c-l, NY ....ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, NY ...ton	...	15.00	...	15.00	...	...
Wood Flour, c-l, bgs ....ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks ....gal.	.31	.33	.27	.33	.27	.29
Coml, tks, wks, frt allowed ....gal.	...	.30	.26	.30	...	.26
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY ....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride fused, 600 lb drs, wks ....lb.	.04½	.05¾	.04½	.05¾	.04¼	.05¼
Gran, 500 lb bbls, wks ..lb.	.05	.05¾	.05	.05¾	.05⅛	.06
Soln 50%, tks, wks..100 lb.	...	2.00	...	2.00	...	2.00
Cyanide, 100 lb drs ....lb.	.36	.41	.36	.41	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv ....lb.	...	.0585	.057	.0585	.0567½	.071
Metal, high grade slabs, c-l, NY ....100 lb.	...	4.20	4.075	4.20	4.05	4.75
E. St. Louis ....100 lb.	...	3.90	3.725	3.90	3.70	4.46
Oxide, Amer, bgs, wks..lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
French, 300 lb bbls, wks ....lb.	.06½	.10⅞	.06½	.10⅞	.05¾	.11⅛
Palmitate, bbls ....lb.	.22	.23	.21	.23	.20	.22
Perborate, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls ....lb.	.19	.22	.18	.22	.18	.21

Current

Zinc Sulfate
Oil, Whale

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Zinc Sulfate, crys, 400 lb bbl, wks ....lb.	.028	.033	.028	.033	.02¾	.033
Flake, bbls ....lb.	.035	.032	.035	.032	...	...
Sulfide, 500 lb bbls, delv lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.13½
bgs, delv ....lb.	.10½	.11½	.10½	.11½	...	...
Sulfocarbolate, 100 lb kgs ....lb.	.24	.25	.24	.25	.21	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs ....lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs ....lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Castor, No. 3, 400 lb bbls..lb.	.09¾	.10½	.09¾	.10½	.09¾	.10½
Blown, 400 lb bbls ....lb.	.11½	.12¼	.11½	.16	.11½	12¾
China Wood, bbls spot NY lb.	.16	Nom.	.094	.12½	.07½	.099
Tks, spot NY ....lb.	...	Nom.	.088	.1160	.07¼	.094
Coast, tks ....lb.	...	.12	.087	.12	.06⅞	.094
Coconut, edible, bbls NY..lb.	...	.10½	.04	.12	.04¾	.10¾
Manila, bbls NY ....lb.	.05⅛	.05¼	.04¾	.05¼	.03¾	.04¾
Tks, NY ....lb.	.05	.05⅛	.03¾	.06¼	.02⅝	.03¾
Tks, Pacific Coast ...lb.	.04¾	.05	.03½	.06	.02¼	.02½
Cod, Newfoundland, 50 gal bbls ....gal.	.35	.36	.36	.38	.34	.40
Copra, bgs, NY ....lb.	.0275	.0285	.02	.038	.0012	.021
Corn, crude, bbls, NY ....lb.	...	.11½	.10½	.12½	.04⅝	.10½
Tks, mills ....lb.	...	.09¾	.09½	.11	.03½	.09½
Refd, 375 lb bbls, NY ..lb.	...	.12½	.12	.14	.05¾	.12
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls, NY ....lb.	.05¼	.05¾	.04½	.05¾	.02¾	.05½
English, brown, bbls, NY lb.	.05½	.06½	.05¼	.06½	.03¾	.05⅜
Greases, Yellow ....lb.	.06½	.06⅝	.05	.06⅝	.02⅜	.05⅛
White, choice bbls, NY lb.	.07⅜	.08¼	.05¼	.08¼	.02¾	.05⅝
Herring, Coast, tks ....gal.	.28	Nom.	.23	Nom.	.15	.23
Lard Oil, edible, prime ...lb.	...	.17	.09¾	.17	...	.09¾
Extra, bbls ....lb.	...	.11½	.08½	.11½	.07	.08½
Extra, No. 1, bbls ....lb.	...	.11	.08¼	.11	.06⅜	.08¼
Linseed, Raw, less than 5 bbl lots ....lb.	...	.103	.095	.103	.101	.105
bbls, c-l spot ....lb.	...	,095	.087	.095	.087	.101
Tks ....lb.	...	.089	.081	.089	.081	.095
Menhaden, tks, Baltimore gal.	.35	Nom.	.25	.35	.15	.25
Refined, alkali, drs ....lb.	...	.075	.061	.075	.052	.069
Tks ....lb.	...	.069	.055	.069	.046	.061
Light pressed, drs ....lb.	...	.069	.055	.069	.046	.057
Tks ....lb.	...	.063	.049	.063	.04	.05
Neatsfoot, CT, 20° bbls, NY ....lb.	...	.16½	...	.16½	...	.16½
Extra, bbls, NY ....lb.	...	.11¼	.08½	.11¼	.07	.08½
Pure, bbls, NY ....lb.	...	.12	...	.12	.12	.13
Oleo, No. 1, bbls, NY ....lb.	...	.14½	.10¾	.14½	.06	.11½
No. 2, bbls, NY ....lb.	...	.13¾	.10	.13¾	.05⅜	.11¼
Olive, denat, bbls, NY ...gal.	.85	.86	.84	.95	.76	.90
Edible, bbls, NY ....gal.	1.65	1.80	1.55	1.80	1.55	1.90
Foots, bbls, NY ....lb.	.08¼	.08¾	.07⅛	.08¾	.06½	.07½
Palm, Kernel, casks ....lb.	.05	Nom.	.03	.05⅜	.02½	.04¼
Niger, cks ....lb.	...	.05¾	.034	.05¾	.031	.03¾
Peanut, crude, bbls, NY ..lb.	...	.10½	.10½	.10¾	.06½	.10¾
Refined, bbls, NY ....lb.	...	.13	.12½	.14	.07½	.12½
Perilla, drs, NY ....lb.	.08⅛	.08⅜	.08⅝	.08¾	.08¼	.09⅝
Tks, Coast ....lb.	.08	Nom.	.08	.08¼	.07½	.09
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.088	.09	.08	.09	.08	.082
Denatured, drs. NY ...gal.	.46	.47	.40	.53	.37	.44
Red, Distilled, bbls ....lb.	.09⅛	.10⅛	.07⅜	.10⅛	.06⅞	.08⅜
Tks ....lb.	...	.08¼	.06½	.08¼	.06	.06½
Salmon, Coast, 8000 gal tks ....gal.	.32½	Nom.	.25	.32½	.15	.21
Sardine, Pac Coast, tks ..gal.	...	.37	.24½	.37	.13	.25
Refined alkali, drs ....lb.	.075	.079	.065	.079	...	...
Tks ....lb.	...	.069	.06	.069	...	...
Light pressed, drs ....lb.	.069	.073	.055	.073	...	...
Tks ....lb.	...	.063	.049	.063	...	...
Sesame, yellow, dom ....lb.	.13¼	.13½	.12¼	.13¾	.07½	.13¼
White, dos ....lb.	.13¼	.13½	.12¾	.13¾	.08	.13¼
Soy Bean, crude Pacific Coast ....lb.	...	Nom.	...	Nom.	...	Nom.
Dom, tks, f.o.b. mills ..lb.	...	.095	.08	.10	.06	.08
Crude, drs, NY ....lb.	.106	.11	.086	.11	.066	.09
Refd, bbls, NY ....lb.	.106	.115	.091	.115	.071	.102
Tks ....lb.	.10	.10½	.08	.10½	...	...
Sperm, 38° CT, bleached, bbls NY ....lb.	.099	.101	.099	.101	.106	.11
45° CT, bleached, bbls, NY ....lb.	.092	.094	.092	.094	.099	.103
Stearic Acid, double pressed dist bgs ....lb.	.11¼	.12¼	.10	.12¼	.09	.11
Double pressed saponified bags ....lb.	.11¾	.12¾	.09	.12¾	.09	.10
Triple pressed dist bgs ..lb.	.14	.15	.12¾	.15¼	.11¾	.13¾
Stearine, Oleo, bbls ....lb.	.11½	.11¾	.09¼	.12½	.05	.10⅝
Tallow City, extra loose ..lb.	.06⅞	.07	.05⅜	.07	.02⅞	.05⅜
Edible, tierces ....lb.	...	.08¼	.07¼	.08¼	.04¾	.07¼
Acidless, tks, NY ....lb.	...	.10¾	.07½	.10¾	.06	.07½
Vegetable, Coast mats ..lb.	.07¼	Nom.	.07¼	Nom.	.06	.07¼
Turkey Red, single, bbls ..lb.	.07½	.08	.07½	.08	.07½	...
Double, bbls ....lb.	.12½	.13	.12½	.13	.12½	.13
Whale, crude, coast, tks ..lb.	...	.04	...	.04	...	...
Winter bleach, bbls, NY lb.	.081	.083	.07	.083	...	.072
Refined, nat, bbls, NY ..lb.	.077	.083	.064	.081	.064	.07

* New crop shipment tanks .076.

Index to Advertisers

"We"—Editorially Speaking

We award the *Croix de Guerre*, with a couple of palm leaf fans, to the Westvaco Chlorine Products Company, not only for the cleverness of their invitation, but also for the generosity of their hospitality at the Board of Trade Drug and Chemical Dinner:

MARCH 21, 1935
AT HOME 6:00 P. M. TO 6:00 A. M.

COME UP AND SEE US ANYTIME

Louis Weisberg, who registers so able a complaint against government competition with consulting chemists and chemical engineers, knows whereof he speaks, for he worked in the Color Laboratory of the Bureau of Chemistry, and has rounded out his experience by being a research chemist for the Barrett Company, for the past fourteen years on his own in consulting practice with the firm of Weisberg & Greenwald, in New York City. He hails from Dallas, in Texas, and was trained at the University of Texas and M. I. T. His pleasures are diversified, embracing symphonic music and the theatre, mathematical physics and economics for reading, from which you can gather that he is indeed a hardy soul.

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It begins to look very much as if the net result of the World War was just simply an exchange of Kaiser Wilhelm for Herr Hitler.

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Who won the War, anyway?

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Now that there is some loose talk about the Administration returning to the principles of the Democratic party, as set forth in the platform upon which Roosevelt ran and to which as candidate he subscribed, they might consider his statement of July 30, 1932: "Our party says clearly that not only must government income meet prospective expenditures, but this income must be obtained on the ability to pay."

"Is the nitrate manufacturing equipment at Muscle Shoals obsolete?" asked the attorney for the Alabama Power Company, cross-examining John R. Neely, secretary of the Tennessee Valley Authority, in the case to test the constitutionality of the T. V. A. Act.

And Mr. Neely answered, "I would not say so."

Well, Mr. Neely, what would you say?

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During the next month, the chemical industry is going on the air for several nation-wide hook-ups, but we doubt if any better job of explaining the whys and wherefores of a chemical manufacturing operation will be broadcast during the meeting of the American Chemical Society than was done by Lammot du Pont over the Columbia Network last month on the fourteenth, and which we are publishing on page 325 in this issue.

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According to *The Midland Republican*, chemical tests are being advocated for drunken drivers. We can readily picture a supposedly inebriated gentleman with a flair for repartee inquiring, "Is this one on the house?"

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Running through the "Morgue" we ran across an editorial in *Rock & Quarry*, written in 1925, in which the chemists of this country were challenged to solve the problem of our foreign dependence for potash. Well, the chemists have done their part, but as usual, the politicians who yell the loudest are lagging in action.

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Arnold Kirkpatrick was born and raised (Midwest for "reared") in Minnesota, received his training at Hamlin University, at Saint Paul, and at the University of Minnesota. After a varied experience among some of the larger chemical manufacturers, and a round at teaching school, he joined Monsanto in 1931, doing research on plasticizers and resins. He is now assigned to the Technical Service Division of Monsanto.

Fifteen Years Ago

From our issues of April, 1920

Frank S. Washburn, president, American Cyanamid, appears before Senate Committee in opposition to operation of Muscle Shoals nitrate plant.

R. & H. Chemical Co. moves to Sixth Avenue offices after more than twenty years on William Street.

S. M. Moneypenny, of H. J. Baker & Brother, returns from abroad.

Stock of Barrett Company quoted at 132 on New York Stock Exchange.

Butterworth-Judson and Mutual Chemical plants close down, due to lack of coal caused by railroad strike.

Calco sells Newark plant to Tower Manufacturing Co.

Home of Dr. Elvin H. Killheffer, at Lake Hopatcong, N. J., purchased from Rex Beach, destroyed by fire.

Methanol price jumps to $2.65 per gallon.

Edward Mallinckrodt, Sr., elected chairman committee to arrange ACS meeting in St. Louis.

Raw Materials

"Salt, lime, and sulfur—and the greatest of these is salt" was the witty John Teeple's characterization of the raw materials of chemical industry. But there are others—coke and coal, potash and phosphate rock, cottonseed oil and cotton cellulose—to pick out a couple offhand, and within the past ten years both technical changes and economic changes have been tumbling about the markets for chemical raw materials till an entirely new set up prevails.

Next month we begin a series of articles on the more important of these starting points of chemical operations. Where do they come from and what are they used for — with lots of charts and tables—that is what you can anticipate.